Vol. 992 Number 3

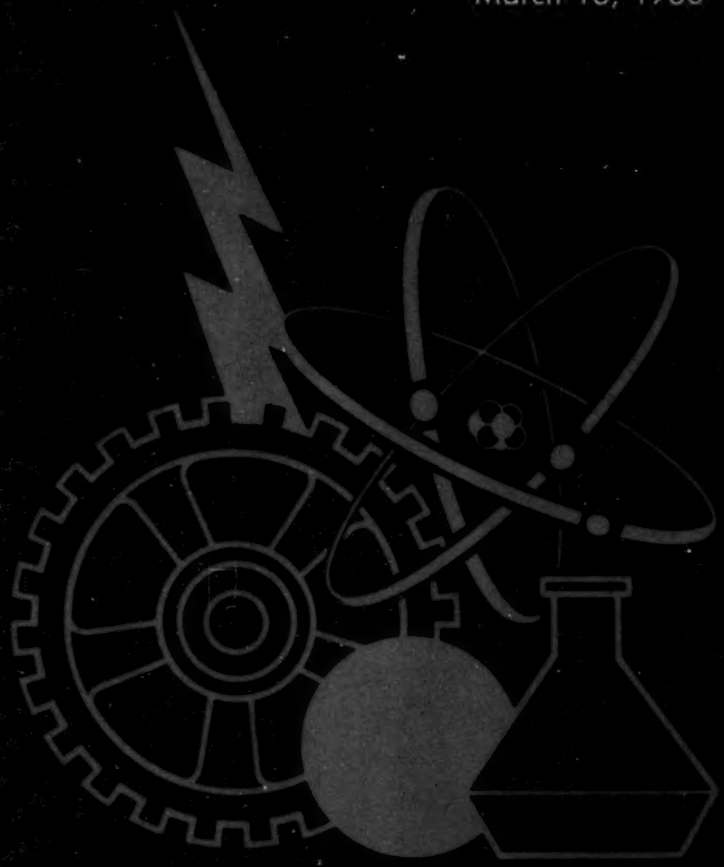
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

March 18, 1980



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

March 18, 1980 Volume 992 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of February 12, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Jan. 28, 1980.

Availability of U.S. Patent Classification Microfilm Publications

The Patent and Trademark Office announces the availability of new editions of two patent classification microfilm publications: "U.S. Patent Classification—Subclass Listing (PTO 002.1–7912M) and "U.S. Patent Classification—Numeric Listing" (PTO 001.1–7912M). Both publications are dated December 1979 and reflect new patent issues and reclassifications through the end of the month.

The "U.S. Patent Classification—Subclass Listing" presents in sequence by the classes, subclasses, and digests of the U.S. classification system, the patent numbers of the U.S. patents which are classified as "originals," "cross references," and "unofficial cross references" in each of the subclasses. Within each subclass, the patent numbers are listed in numerical sequence. Symbols appear in conjunction with patent numbers to denote those patents which are classified as cross references in a subclass.

The "U.S. Patent Classification—Numeric Listing" consists of a listing, in ascending numeric sequence, of all U.S. patents and related items together with the original and all cross-reference classifications (both "official" and "unofficial") for each patent current as of the date of publication.

Both of the above publications are offered for sale by the National Technical Information Service in 16mm microfilm on plain (open) reels or in any of three types of cartridges—3M, Recordak, and Kodak "Thread Easy" magazines. They may be purchased in sets or by individual reel.

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U.S. Patent Classification—Subclass Listing

The entire set of 9 reels carries accession number PB80–123706 and is priced at $58.00 in plain reels and $76.00 in cartridges. Individual reels may be purchased at $10.00 each in plain reels or $12.00 in cartridges. Orders must specify the NTIS accession number given below and, also, by the appropriate letter code,[1] the choice of the optional forms in which the buyer desires to receive the microfilm.

Reel Number	NTIS Accession Number	Classes (Contents)
1–9 (Full Set)	PB80–123706	All.
1	PB80–123714	Designs, Plants, Cl. 2–40.
2	PB80–123722	42–75
3	PB80–123730	76–130.
4	PB80–123748	131–188.
5	PB80–123755	190–235.
6	PB80–123763	236–264.
7	PB80–123771	266–328.
8	PB80–123789	329–417.
9	PB80–123797	418–585

U.S. Patent Classification—Numeric Listing

The entire set of 20 reels carries accession number PB80–123805 and is priced at $124.00 in plain reels and $164.00 in cartridges. A partial set of the last 7 reels (nos. [1]4–20. from 1958 to the present), carries accession number PB80–124019 and is priced at $46.00 in plain reels and $60.00 in cartridges. Individual reels may be purchased at $10.00 each in plain reels or $12.00 in cartridges. Please specify the form in which you want to receive the microfilm by writing the appropriate letter code[1] after the accession number.

Reel Number	NTIS Accession Number	Beginning Patent Number	Ending Patent Number
1–20 (Full Set)	PB80–123805	All	
14–20 (Partial Set)	PB80–124019	[2] 2,860,852	4,180,866
1	PB80–123813	See Below [3]	
2	PB80–123821	21,247	308,602
3	PB80–123839	308,603	578,922
4	PB80–123847	578,923	841,604
5	PB80–123854	841,605	1,099,436
6	PB80–123862	1,099,437	1,353,769
7	PB80–123870	1,353,770	1,604,483
8	PB80–123888	1,604,484	1,843,331
9	PB80–123896	1,843,332	2,061,513
10	PB80–123904	2,061,514	2,267,418
11	PB80–123912	2,267,419	2,469,316
12	PB80–123920	2,469,317	2,665,044
13	PB80–123938	2,665,045	2,860,851
14	PB80–123946	2,860,852	3,053,610
15	PB80–123953	3,053,611	3,238,910
16	PB80–123961	3,238,911	3,423,589
17	PB80–123979	3,423,590	3,616,242
18	PB80–123987	3,616,243	3,808,176
19	PB80–123995	3,808,177	3,994,623
20/21	PB80–124001	3,994,624	4,180,866

[1] Insert the letter code representing choice of one of the following optional means of receiving the film:
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R = Reels in Recordak cartridges.
T = Reels in "Thread Easy" magazines.

[2] Issued in November 1958.

[3] Reel 1 includes the following ranges of numbers:

"Additional Improvements"	AI2–AI318
Design Patents	D1–D253,795
Plant Patents	PP1–PP4,490
Reissue Designs	RD301–RD25,414
Reissue Patents	RE1–RE30,182
Reissue Patents Issued Prior to 1836	RX36–RX112
Defensive Publications	T856.001–T989,005
Patents Issued Prior to 1836	X1–X9,900
Patents	1–21,246

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ALFRED C. MARMOR,
Administrator for Documentation,
February 14, 1980.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,461,461, Re. S.N. 101,536, Filed Dec. 10, 1979, Cl. 544/323, 6-AMINO-4-(SUBSTITUTED AMINO) 1,2-DIHYDRO-1-HYDROXY-2-IMINOPYRIMIDINES, William C. Anthony, et al., Owner of Record: *The Upjohn Company, Kalamazoo, Mich.*, Attorney or Agent: Martin B. Barancik, et al., Ex. Gp.: 122

3,500,552, Re. S.N. 105,792, Filed Dec. 20, 1979, Cl. 34/8, METHOD AND APPARATUS FOR DRYING FOODS, Daniel F. Farkas, et al., Owner of Record: *The United States of America as represented by The Secretary of Agriculture, Washington, D.C.*, Attorney or Agent: M. Howard Silverstein, et al., Ex. Gp.: 344

3,727,004, Re. S.N. 098,995, Filed Nov. 30, 1979, Cl. 179/1 D, LOUDSPEAKER SYSTEM, Amar G. Bose, Owner of Record: *Bose Corporation, Framingham, Mass.*, Attorney or Agent: Charles Hieken, et al., Ex. Gp.: 234

3,952,097, Re. S.N. 101,073, Filed Dec. 7, 1979, Cl. 424/177, NUCLEASE-RESISTANT HYDROPHILIC COMPLEX OF POLYRIBOINOSINIC-POLYRIBOCYTIDYLIC ACID, Hilton B. Levy, Owner of Record: *The United States of America as represented by The Department of Health, Education and Welfare, Washington, D.C.*, Attorney or Agent: John Clark Holman, et al., Ex. Gp.: 125

4,024,241, Re. S.N. 101,072, Filed Dec. 7, 1979, Cl. 424/177, NUCLEASE-RESISTANT HYDROPHILIC COMPLEX OF POLYRIBOINOSINIC-POLYRIBOCYTIDYLIC ACID, Hilton B. Levy, Owner of Record: *The United States of America as represented by The Secretary of Health, Education and Welfare, Washington, D.C.*, Attorney or Agent: John Clark Holman, et al., Ex. Gp.: 125

4,044,533, Re. S.N. 068,672, Filed Aug. 22, 1979, Cl. 56/11.3, LAWN MOWER BLADE CLUTCH AND BRAKE, Gerald H. Wick, Owner of Record: *Outboard Marine Corp., Waukegan, Ill.*, Attorney or Agent: Robert E. Clemency, et al., Ex. Gp.: 333

4,063,752, Re. S.N. 105,287, Filed Dec. 19, 1979, Cl. 280/624, SKI BINDING HAVING PRESET MEANS AND DETENT TRIGGER FOR SAID PRESET MEANS, Richard A. Whitaker, et al., Owner of Record: *Richard G. Spademan, Belmont, Calif.*, Attorney or Agent: Warren M. Becker, Ex. Gp.: 316

4,064,995, Re. S.N. 105,714, Filed Dec. 20, 1979, Cl. 211/187, DISPLAY RACK, Rafael T. Bustos, Owner of Record: *Leggett and Plate Incorporated, Carthage, Mo.*, Attorney or Agent: Herbert C. Brinkman, et al., Ex. Gp.: 355

4,065,246, Re. S.N. 105,340, Filed Dec. 19, 1979, Cl. 425/528, INJECTION BLOW MOLDING APPARATUS, Paul Marcus, Owner of Record: *Inventor,* Attorney or Agent: David S. Kane, et al., Ex. Gp.: 147

4,086,651, Re. S.N. 105,844, Filed Dec. 20, 1979, Cl. 364/487, ELECTRICAL OUTPUT PEAK DETECTING APPARATUS, Andrew R. Muir, et al., Owner of Record: *The Perkin-Elmer Corporation, Norwalk, Conn.*, Attorney or Agent: S. A. Giarratana, et al., Ex. Gp.: 236

4,124,448, Re. S.N. 109,908, Filed Jan. 7, 1980, Cl. 435/240, PROCESS FOR THE LARGE SCALE PRODUCTION OF HUMAN GROWTH HORMONE BY SERIAL SECONDARY SUSPENSION CULTURE, Mandayam J. Narasimhan, et al., Owner of Record: *The Regents of The University of Minnesota, Minneapolis, Minn.*, Attorney or Agent: L. Paul Burd, et al., Ex. Gp.: 172

4,130,082, Re. S.N. 108,615, Filed Dec. 31, 1979, Cl. 116/5, FLASHLAMP ASSEMBLY FOR PROVIDING HIGHLY INTENSE AUDIBLE AND VISUAL SIGNALS, Andre C. Bouchard, et al., Owner of Record: *GTE Sylvania, Incorporated, Danvers, Mass.*, Attorney or Agent: Lawrence R. Fraley, Ex. Gp.: 244

4,141,880, Re. S.N. 098,092, Filed Nov. 28, 1979, Cl. 260/37 N, FLAME RETARDED NYLON COMPOSITION, Richard C. Nametz, et al., Owner of Record: *Velsicol Chemical Corporation, Chicago, Ill.*, Attorney or Agent: Robert J. Schwarz, Ex. Gp.: 142

4,151,555, Re. S.N. 106,073, Filed Dec. 20, 1979, Cl. 358/75, OPTICAL SCANNING AND ENCODING DEVICE, James E. Burnett, Owner of Record: *The Mead Corporation, Dayton, Ohio,* Attorney or Agent: Nathaniel R. French, et al., Ex. Gp.: 233

4,162,133, Re. S.N. 077,770, Filed Sep. 21, 1979, Cl. 405/258, RESIN REINFORCED EXPANSION ANCHOR AND METHOD OF INSTALLATION, Carl A. Clark, et al., Owner of Record: *The Eastern Company, Syracuse, N.Y.*, Attorney or Agent: Charles S. McGuire, Ex. Gp.: 354

4,175,120, Re. S.N. 107,493, Filed Dec. 26, 1979, Cl. 424/54, DENTIFRICE, Murray L. Schole, Owner of Record: *Inventor,* Attorney or Agent: Lorimer Brooks, et al., Ex. Gp.: 125

PATENT NOTICES

Certificates of Correction for the Week of Mar. 18, 1980

Re. 30,085	4,139,364	4,167,507	4,175,045
Re. 30,150	4,140,639	4,168 320	4,175,123
D. 252,392	4,140,678	4,168,676	4,175,445
3,674,447	4,140,955	4,168,882	4,175,494
3,890,276	4,142,535	4,169,145	4,175,512
3,973,561	4,142,992	4,169,249	4,176,087
3,974,335	4,143,042	4,169,292	4,176,131
4,005,005	4,144,116	4,169,336	4,176,286
4,010,221	4,144,491	4,176,001	4,176,335
4,023,258	4,144,688	4,170,179	4,176,398
4,054,499	4,148,721	4,170,256	4,176,405
4,061,850	4,148,791	4,170,676	4,176,642
4,068,085	4,150,024	4,171,401	4,176,673
4,070,450	4,150,134	4,172,160	4,176,785
4,073,133	4,150,226	4,172,305	4,177,305
4,079,172	4,152,971	4,172,504	4,177,658
4,081,460	4,154,691	4,172,627	4,177,660
4,082,681	4,158,390	4,172,728	4,177,688
4,092,120	4,159,329	4,173,136	4,177,897
4,093,906	4,159,821	4,173,372	4,178,420
4,101,474	4,160,339	4,173,514	4,178,472
4,102,051	4,160,447	4,173,602	4,178,904
4,102,640	4,162,682	4,173,647	4,178,959
4,107,651	4,162,778	4,173,950	4,178,967
4,109,088	4,163,105	4,174,181	4,179,265
4,113,810	4,163,212	4,174,377	4,179,383
4,120,452	4,163,567	4,174,436	4,179,511
4,121,033	4,164,397	4,174,478	4,180,373
4,122,901	4,164,544	4,174,519	4,180,514
4,123,543	4,164,814	4,174,521	4,180,672
4,128,157	4,165,410	4,174,537	4,180,831
4,129,287	4,165,961	4,174,664	4,180,878
4,132,063	4,166,115	4,174,751	4,181,285
4,133,277	4,166,795	4,174,771	4,181,286
4,135,622	4,167 034	4,174,783	4,181,297
4,135,736	4,167,067	4,174,907	4,181,315
4,135,870	4,167,213	4,174,934	4,181,902
4,138,355			4,181,915

Disclaimers

Des. No. 213,431.—*Leland George Stone*, Mundelein, Ill. KNOB. Patent dated March 4, 1969. Disclaimer filed June 10, 1979, by the assignee, *Amerock Corporation*.

Hereby enters this disclaimer to the single claim of said patent.

Des. No. 251,351.—*Ottorino N. Mercadante*, Corning, N.Y. PLATE OR THE LIKE. Patent dated March 20, 1979. Disclaimer filed Jan. 25, 1980, by the assignee, *Corning Glass Works*.

Hereby enters this disclaimer to the sole claim of said patent.

3,220,893.—*Robert Ross Blackwood* and *William David Cheesman*, Milwaukee, Wis. METAL QUENCHING MEDIUM. Patent dated Nov. 30, 1965. Disclaimer filed Jan. 10, 1980, by the assignee, *Union Carbide Corporation*.

Hereby enters this disclaimer to the remaining term of said patent.

4,025,249.—*Jerry A. King*, Palm Beach Gardens, Fla. APPARATUS FOR MAKING METAL POWDER. Patent dated May 24, 1977. Disclaimer filed Dec. 3, 1979, by the assignee, *United Technologies Corporation*.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,086,564.—*William Eugene Claxton*, Mogadore, Ohio. ELECTRONIC ALARM CIRCUITRY. Patent dated Apr. 25, 1978. Disclaimer filed Nov. 14, 1979, by the assignee, *The Firestone Tire & Rubber Co.*

Hereby enters this disclaimer to claims 1, 3, 6, 7, 10 and 11 of said patent.

4,164,078.—*Adolph E. Goldfarb*, Tarzana, Calif. ELECTRONIC QUIZ APPARATUS. Patent dated Aug. 14, 1979. Disclaimer filed Jan. 14, 1980, by the inventor.

Hereby enters this disclaimer to claims 11–18 inclusive of said patent.

Dedications

3,157,265.—*Leon E. Palmer*, Lexington, Ky. PRINT INTERLOCK FOR TYPEWRITER. Patent dated Nov. 17, 1964. Dedication filed Dec. 5, 1979, by the assignee, *International Business Machines Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

3,226,205.—*Raymond G. Rohlfing*, Bartlesville, Okla. REACTOR IMPELLER WITH FEED INLET ALONG SHAFT. Patent dated Dec. 28, 1965. Dedication filed June 13, 1979, by the assignee, *Phillips Petroleum Company*.

Hereby dedicates the entire remaining term of said patent to the Public.

3,383,435.—*Eric P. Cizek*, Ann Arbor, Mich. BLEND OF A POLYPHENYLENE ETHER AND A STYRENE RESIN. Patent dated May 14, 1968. Dedication filed Nov. 14, 1979, by the assignee, *General Electric Company*.

Hereby dedicates to the Public claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 21 and 22 of said patent.

3,451,785.—*Raymond G. Rohlfing*, and *Stanley J. Marwil*, Bartlesville, Okla. PRESSURE RELIEF SYSTEM FOR PRESSURE VESSELS. Patent dated June 24, 1969. Dedication filed April 5, 1979, by the assignee, *Phillips Petroleum Company*.

Hereby dedicates the entire remaining term of said patent to the Public.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

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Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent-application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data

will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

OTJAG, DEPARTMENT OF THE ARMY

Chief, Intellectual Properties Division,
Room 2D 444, Pentagon, Washington, D.C. 20310

Patent application 6,037,258. Erosion Lithography and Nozzle. Filed May 9, 1979.

Patent application 946,490. Tape Automated Bonding Test Board. Filed Sept. 28, 1978.

Patent application 962,522. Cellulase-Producing Microorganism. Filed Nov. 20, 1978.

Patent 4,149,776. Portable Microfiche Reading Instrument. Filed Apr. 24, 1978. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,098,476. Mechanical Support. Filed June 7, 1977. Patented July 4, 1978. Not available NTIS.

Patent 4,100,742. Turbocompound Engine with Turbocharger Control. Filed Dec. 9, 1976. Patented July 18, 1978. Not available NTIS.

Patent 4,101,896. Camouflaged Dual-Slot Antenna. Filed Apr. 14, 1977. Patented July 18, 1978. Not available NTIS.

Patent 4,102,988. Cyano Compounds as Fuels for HF or DF Lasers. Filed Oct. 3, 1977. Patented July 25, 1978. Not available NTIS.

Patent 4,108,191. Fan Mesh Disrupter. Filed Sept. 17, 1975. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,108,700. Method of Making Coned Joint for Joining Dissimilar Diameter Filament Wound Tubes. Filed May 5, 1977. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,116,404. Automatic Balancing Concent. Filed July 22, 1977. Patented Sept. 26, 1978. Not available NTIS.

Patent 4,117,760. Feed Pawl Antibounce Device. Filed Apr. 14, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,673. Phase Lock Loop Controlled Offset Local Oscillator System. Filed Feb. 10, 1978. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,706. Microstrip-Fed Parasitic Array. Filed Sept. 9, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,727. Mox Multi-layer Switching Device Comprising Niobium Oxide. Filed Sept. 9, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,120,413. Self Load/Unload Transporter. Filed May 31, 1977. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,121,128. Collective Ion Accelerator with Foil-Less Beam Extraction Window. Filed Aug. 15, 1977. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,121,215. Corner Reflector Antenna for DF and Tracking Applications Filed Aug. 4, 1972. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,121,467. Non-Destructive Technique for Surface Wave Velocity Measurement. Filed May 31, 1977. Patented Oct. 24, 1978. Not available NTIS.

Patent 4,123,165. Attitude Determination Using Two Color, Dual-sweeping Laser System. Filed May 31, 1977. Patented Oct. 31, 1978. Not available NTIS.

Patent 4,123,168. Laser Optical Lever Adjunct. Filed July 22, 1977. Patented Oct. 31, 1978. Not available NTIS.

Patent 4,124,792. Eddy Current Probe Subsystem. Filed July 25, 1977. Patented Nov. 7, 1978. Not available NTIS.

Patent 4,125,052. Ammunition Rack for Tank Turret. Filed May 9, 1977. Patented Nov. 14, 1978. Not available NTIS.

Patent 4,125,086. Nozzle Beam Type Metal Vapor Source. Filed Jan. 6, 1977. Patented Nov. 14, 1978. Not available NTIS.

Patent 4,126,861. Pulse Doppler Ranging System. Filed Mar. 23, 1967. Patented Nov. 21, 1978. Not available NTIS.

Patent 4,127,826. Gain Spike and Mode Control for Spiked Lasers. Filed May 13, 1977. Patented Nov. 28, 1978. Not available NTIS.

Patent 4,128,441. Solubility of XPGA in a Polyurethane Binder Filed Dec. 1, 1977. Patented Dec. 5, 1978. Not available NTIS.

Patent 4,128,812. Phase Discriminator. Filed Aug. 9, 1977. Patented Dec. 5, 1978. Not available NTIS.

Patent 4,129,836. Frequency Stable Boron Nitride Channel Laser Filed Apr. 4, 1977. Patented Dec. 12, 1978. Not available NTIS.

Patent 4,130,917. Flexible Slide Fastener. Filed Jan. 16, 1978. Patented Dec. 26, 1978. Not available NTIS.

Patent 4,131,256. Engine Mount. Filed July 27, 1977. Patented Dec. 26, 1978. Not available NTIS.

Patent 4,132,150. Blast Actuated Detent. Filed Aug. 8, 1977. Patented Jan. 2, 1979. Not available NTIS.

Patent 4,132,298. Transmission Synchronizer. Filed July 13, 1977. Patented Jan. 2, 1979. Not available NTIS.

Patent 3,132,740. Preparation of Carboranyl Sulfides. Filed Oct 3, 1972. Patented Jan. 2, 1979. Not available NTIS.

Patent 4,132,928. Device for Identifying Waveforms in a Multiple Oscilloscope Display. Filed Apr. 28, 1977. Patented Jan. 2, 1979. Not available NTIS.

Patent 4,132,945. System for Aligning Whip Antenna Matching Base Units. Filed Dec. 27, 1977. Patented Jan. 2, 1979. Not available NTIS.

Patent 4,133,706. Propellants Containing Carboranylmethyl Alkyl Sulfide Plasticizers. Filed Oct. 3, 1972. Patented Jan. 9, 1979. Not available NTIS.

Patent 4,133,910. Thick Film Deposition of Microelectronic Circuit. Filed Dec. 1, 1977. Patented Jan. 9, 1979. Not available NTIS.

Patent 4,137,351. Filament/Epoxy Camouflage Launch Tubes. Filed Apr. 3, 1978. Patented Jan. 30, 1979. Not available NTIS.

Patent 4,137,819. Launch Tube Antenna. Filed Nov. 28, 1977. Patented Feb. 6, 1979. Not available NTIS.

Patent 4,138,677. Acceleration Filter For Slowdown Discrimination. Filed Jan. 6, 1966. Patented Feb. 6, 1979. Not available NTIS.

Patent 4,143,835. Missile System Using Laser Illuminator. Filed Aug. 16, 1976. Patented May 13, 1979. Not available NTIS.

Patent 4,144,151. Production of B10H14 from B2H6 at Room Temperature by Laser Induced Chemistry Using DF Laser. Filed June 12, 1978. Patented Mar. 13, 1979. Not available NTIS.

Patent 4,144,905. Programmable Fluidic Pressure-to-Electronic Interface System. Filed July 14, 1977. Patented Mar. 20, 1979. Not available NTIS.

Patent 4,146,987. Impulse Activated Counting Device. Filed Nov. 1, 1976. Patented Apr. 3, 1979. Not available NTIS.

Patent 4,148,259. Sabot Assembly for a Subcaliber Spin Stabilized Projectile. Filed Oct. 3, 1977. Patented Apr. 10, 1979. Not available NTIS.

Patent 4,148,381. Coded Actuator. Filed Jan. 3, 1977. Patented Apr. 10, 1979. Not available NTIS.

Patent 4,148,929. Stabilized Frozen Potato Salad. Filed Dec. 27, 1977. Patented Apr. 10, 1979. Not available NTIS.

Patent 4,149,167. Radar Jamming Transmitter. Filed Mar. 4, 1955. Patented Apr. 10, 1979. Not available NTIS.

Patent 4,149,169. Configuration of Two Antennae with Signal Isolation. Filed Jan. 20, 1978. Patented Apr. 10, 1979. Not available NTIS.

Patent 4,149,170. Multiport Cable Choke. Filed Apr. 28, 1978. Patented Apr. 10, 1979. Not available NTIS.

Patent 4,149,308. Method of Forming an Efficient Electron Emitter Cold Cathode. Filed Dec. 16, 1977. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,149,404. Pressure Testing of Rocket Motor Cases. Filed May 24, 1978. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,149,430. Brake for Ball Screw. Filed Sept. 26, 1977. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,149,447. Multi-Effect Passive Detonation Trap. Filed Apr. 29, 1977. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,149,781. Sealed, Super 8, Optical Sound Projection Means. Filed Feb. 24, 1976. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,150,055. Reduction and Desulfonation of 2,4- and 2,6-Dinitrobenzenesulfonates, which May Contain a Methyl Group in the 5-Position, to Primary Amino Compounds. Filed Sept. 7, 1978. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,150,057. Method for Preparation of a Carboranyl Burning Rate Accelerator Precursor. Filed Mar. 29, 1978. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,150,920. Rotor Blade Tipweight Assembly. Filed Dec. 2, 1977. Patented Apr. 24, 1979. Not available NTIS.

Patent 4,151,233. Method for Preparing a Smoke Agent. Filed Oct. 19, 1977. Patented Apr. 24, 1979. Not available NTIS.

Patent 4,151,476. Magnetic Bubble Traveling Wave Amplifier. Filed Aug. 15, 1978. Patented Apr. 24, 1979. Not available NTIS.

Patent 4,151,753. Lockable Gear-Rack Unit. Filed Jan. 19, 1978. Patented May 1, 1979. Not available NTIS.

Patent 4,152,625. Plasma Generation and Connnement with Continuous Wave Lasers. Filed May 8, 1978. Patented May 1, 1979. Not available NTIS.

Patent 4,152,706. Log Periodic Zig Zag Monopole Antenna. Filed Dec. 27, 1977. Patented May 1, 1979. Not available NTIS.

Patent 4,153,169. Loading-Unloading Capability for Cargo Box Transport Vehicle. Filed May 8, 1978. Patented May 8, 1979. Not available NTIS.

Patent 4,153,282. Coned Joint for Joining Dissimilar Diameter Filament Wound Tubes. Filed Feb. 27, 1978. Patented May 8, 1979. Not available NTIS.

Patent 4,153,761. Method of Removing Foulants from Ion Exchange Resins. Filed Apr. 21, 1978. Patented May 8, 1979. Not available NTIS.

Patent 4,154,012. Expendable Launcher for Non-Lethal Ring Airfoil Projectile. Filed Nov. 25, 1977. Patented May 15, 1979. Not available NTIS.

Patent 4,154,089. Apparatus and Method for Measuring Liquid Water Content of a Cloud or Fog. Filed June 12, 1978. Patented May 15, 1979. Not available NTIS.

Patent 4,154,092. Pneumatic Gross Leak Detector. Filed May 4, 1978. Patented May 15, 1979. Not available NTIS.

Patent 4,154,142. Externally Powered Carrier. Filed Sept. 6, 1977. Patented May 15, 1979. Not available NTIS.

Patent 4,154,633. Method for Making Solid Propellant Compositions Having a Soluble Oxidizer. Filed Apr. 14, 1978. Patented May 15, 1979. Not available NTIS.

Patent 4,155,016. Sharpening High Power Pulses. Filed Nov. 8, 1977. Patented May 15, 1979. Not available NTIS.

Patent 4,155,017. Sharpening High Power Pulses. Filed Nov. 9, 1977. Patented May 15, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE, AF/JACP

1900 Half Street, SW., Washington, D.C. 20324

Patent application 6,047,528. Polyaromatic Ether-Keto-Sulfones and Their Synthesis. Filed June 8, 1979.

Patent application 6,048,951. Propulsion Assist Stage for Geosynchronous Orbit Injection from Space Shuttle. Filed June 15, 1979.

Patent application 6,050,272. Oxide Passivated Mesa Epitaxial Diodes with Integral Plated Heat Sink. Filed June 19, 1979.

Patent application 6,050,273. Liquid Propellant/Regenerative Charging System Bubble Preventer. Filed June 19, 1979.

Patent application 6,050,274. Control Piston for Liquid Propellant Gun Injector. Filed June 19, 1979.

Patent application 6,051,315. Combined Cycle Ramjet Engine. Filed June 22, 1979.

Patent application 6,052,161. Liquid Storing and Releasing Integrated Assembly. Filed June 26, 1979.

Patent application 6,052,162. Optical Beam Mode Controlled Laser System. Filed June 26, 1979.

Patent application 6,052,163. Light Spot Position Sensor for a Wavefront Sampling System. Filed June 26, 1979.

Patent application 6,052,178. Intruder Detector System Having Improved Uniformity of Detection Sensitivity. Filed June 25, 1979.

Patent application 937,909. Metal Nitride Oxide Semiconductor (MNOS) Dosimeter. Filed Aug. 29, 1978.

Patent 4,163,411. Breech Closure Mechanism. Filed Dec. 29, 1977. Patented Aug. 7, 1979. Not available NTIS.

Patent 4,163,629. Turbine Vane Construction. Filed Dec. 23, 1977. Patented Aug. 7, 1979. Not available NTIS.

Patent 4,163,973. Means for Developing a Radar Tracking Error Signal. Filed Feb. 18, 1975. Patented Aug. 7, 1979. Not available NTIS.

Patent 4,163,985. Nonvolatile Punch through Memory Cell with Buried N+ Region in Channel. Filed Sept. 30, 1977. Patented Aug. 7, 1979. Not available NTIS.

Patent 4,164,741. Deception Circuitry for Automatic Range Gate Tracking in Fire Control Radar. Filed Sept. 13, 1968. Patented Aug. 14, 1979. Not available NTIS.

Patent 4,166,071. Monophospha-S-Triazines. Filed Dec. 28, 1977. Patented Aug. 28, 1979. Not available NTIS.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents
Room A2-3018, Washington, D.C. 20545

Patent 4,140,771. Process for Preparing Active Oxide Powders. Filed Feb. 24, 1978. Patented Feb. 20, 1979. Not available NTIS.

Patent 4,142,159. Missing Pulse Detector for a Variable Frequency Source. Filed Nov. 7, 1977. Patented Feb. 27, 1979. Not available NTIS.

Patent 4,142,296. Tool Calibration for Micromachining System. Filed Dec. 14, 1977. Patented Mar. 6, 1979. Not available NTIS.

Patent 4,144,464. Device and Method for Noresonantly Raman Shifting Ultraviolet Radiation. Filed Jan. 25, 1978. Patented Mar. 13, 1979. Not available NTIS.

NATIONAL AERONAUTICS & SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters
NASA Code GP-4, Washington, D.C. 20546

Patent application 6,054,501. Improved Synthesis of Polyformals. Filed July 3, 1979.

Patent application 6,054,502. An Improved Synthesis of 2,4,8,10-Textroxaspiro (5.5) Undecane. Filed July 3, 1979.

Patent application 6,057,465. Pressure Control Valve. Filed July 13, 1979.

Patent application 6,057,526. Spine Immobilization Method and Apparatus. Filed July 13, 1979.

Patent 4,159,576. Radiation Shadow Indicator. Filed Oct. 31, 1978. Patented July 3, 1979. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
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California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 26, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-2-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-14-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	5-3-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-25-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	11-16-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-16-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-29-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-20-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	3-13-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-14-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	12-14-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	1-8-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	8-22-78
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	8-17-78

Expiration of patents: The patents within the range of numbers indicated below expire during January 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,070,801 to 3,076,194, inclusive
Plant Patents ..... Numbers 2,208 to 2,223, inclusive

MARCH 18, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,230

CLOSED CIRCUIT METHOD OF CIRCULATING A SUBSTANTIALLY SOLID FREE DRILLING FLUID

Junius M. Jackson, deceased, late of Kingwood, Tex., and by Betty A. Jackson, executrix, Houston, Tex., assignors to Brinadd Company, Houston, Tex.

Original No. 3,844,361, dated Oct. 29, 1974, Ser. No. 352,527, Apr. 19, 1973. Division of Ser. No. 101,177, Dec. 23, 1970, abandoned. Application for reissue Jun. 6, 1977, Ser. No. 803,601

Int. Cl.² E21B *21/00*; C09K *7/02*

U.S. Cl. 175—66 **9 Claims**

1. A closed circuit method of circulating a substantially solid free drilling fluid comprising (1) formulating a drilling fluid based on water, including an additive to inhibit drilled solids from disintegrating, water soluble weighting agents and a viscosifier consisting of material having no gel strength and no structured viscosity, (2) pumping said drilling fluid down the wellbore through the drilling string and bit and back up to the surface in the annulus surrounding the bit and drill string, (3) screening the drilling fluid to separate out and discard the coarse particles (4) removing the major portion of sand, silt and other particles from said drilling fluid by [settling and decantation] *mechanical means,* (5) removing solids remaining in said drilling fluid by [mechanical means] *settling and decantation* and, (6) returning the cleaned-up substantially solid free drilling fluid to the wellbore.

Re. 30,231

LENS SELECTION DEVICE

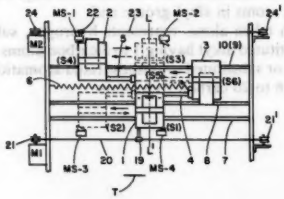
Hiroshi Ikeda, Aichi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Original No. 3,936,150, dated Feb. 3, 1976, Ser. No. 533,920, Dec. 18, 1974. Application for reissue Jan. 26, 1978, Ser. No. 872,515

Claims priority, application Japan, Dec. 22, 1973, 49-2168[U]

Int. Cl.² G02B *15/04*; G03B *27/40*

U.S. Cl. 350—183 **12 Claims**



11. A lens selection device comprising a pair of first lenses each of which is movable between operative and retracted positions, drive means for moving each of said first lenses between its operative and retracted positions, a second lens movable between an operative and a retracted position and means motivated by the movement of a first lens toward an operative position for moving said second lens to its retracted position and responsive to the dispositions of both said first lens in their retracted positions for locating said second lens in its operative position.

Re. 30,232

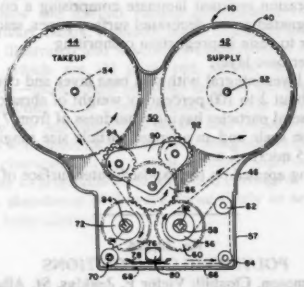
LARGE CAPACITY FILM CASSETTE

Joseph H. Wright, Marblehead, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Original No. 4,018,518, dated Apr. 19, 1977, Ser. No. 531,340, Dec. 10, 1974. Application for reissue Aug. 14, 1978, Ser. No. 933,721

Int. Cl.² G03B *23/02*

U.S. Cl. 352—78 R **8 Claims**



1. A large capacity film cassette for use with projection apparatus having a cassette-receiving well of a size and configuration to receive a limited capacity cassette which includes a pair of radially spaced film strip reels mounted for rotation around parallel axes, and the apparatus including a pair of drive sprockets engagable with the reels of such a limited capacity cassette to effect forward and rewind operation of said reels, said large capacity film cassette comprising:

a large capacity supply reel and large capacity take-up reel;

a housing enclosing and supporting said supply reel and take-up reel in [radially] spaced relation for rotation [around parallel axes], said housing having a projector mounting tongue portion of a size and shape to be received in the receiving well of the projecting apparatus;

means within said housing for guiding a film strip between said supply reel and take-up reel and through an operative projection station within said tongue portion; and

transmission means within said housing for coupling the drive sprockets of the projection apparatus with either said supply reel or said take-up reel while said tongue portion is received in the well, said transmission means including means shiftable between engagement with either said take-up reel or said supply reel in accordance with the direction of rotation of the drive sprockets to effect driving coupling of the drive sprockets respectively therewith during forward and rewind driving operations, and said transmission means comprising a pair of shiftable gears alternately engagable with either said supply reel or said take-up reel, and rocker means for supporting said shiftable gears so that one of said pair of gears engages said take-up reel for rotation thereof to take up the film strip during forward operation and the other of said pair of gears engages said supply reel for rotation thereof during rewind operation of the projection apparatus.

Re. 30,233

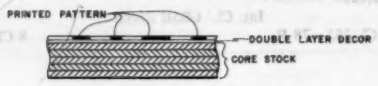
MULTIPLE LAYER DECORATED PAPER, LAMINATE PREPARED THEREFROM AND PROCESS

William C. Lane, Chillicothe, Ohio, and Donald E. Moffatt, Lee, Mass., assignors to The Mead Corporation, Dayton, Ohio

Original No. 3,798,111, dated Mar. 19, 1974, Ser. No. 237,952, Mar. 24, 1972. Continuation-in-part of Ser. No. 147,839, May 28, 1971, abandoned. Application for reissue Jul. 29, 1975, Ser. No. 600,154

Int. Cl.[2] B32B 5/16

U.S. Cl. 428—207 22 Claims



1. An abrasion resistant laminate comprising a core and a resin impregnated cured decorated surface paper, said surface paper, prior to resin impregnation comprising

(a) a paper base layer;

(b) a top layer integral with said base layer and comprising from about 2 to 100 percent by weight of abrasion resisting mineral particles having a hardness of from 7 to 10 on the Moh scale and an average particle size ranging from 10 to 75 microns, and

(c) printing applied on the exposed outer surface of said top layer.

Re. 30,234

POLYMERIC COMPOSITIONS

Keith G. Sampson, Clophill; Victor F. Jenkins, St. Albans, and Anthony J. Bunker, Tickhill, all of England, assignors to Laporte Industries, Limited, Luton, England

Original No. 4,005,155, dated Jan. 25, 1977, Ser. No. 547,215, Feb. 5, 1975. Division of Ser. No. 311,528, Dec. 4, 1972, abandoned. Application for reissue Jan. 18, 1979, Ser. No. 4,492

Claims priority, application United Kingdom, Dec. 9, 1971, 57175/71

Int. Cl.[2] C08L 31/02, 33/14, 61/20, 61/28

U.S. Cl. 525—162 7 Claims

1. A process for the preparation of a crosslinked modified copolymer having the desirable combination of flexibility, hardness and chemical durability which comprises:

a. reacting together at least two ethylenically unsaturated monomers at least one of which is an ethylenically unsaturated hydroxyalkyl ester of formula $CH_2{=}CR_1{-}COOR_2$ in which R_1 is H or an alkyl group and R_2 is an alkyl group to which one or more $-CH_2OH$ groups are attached, to form a copolymer,

b. modifying said copolymer by reacting it with from 10% to 60% by weight of an epsilon caprolactone, and

c. crosslinking the modified copolymer of (b) with from 10% to 40% by weight of an amino resin selected from the group consisting of urea formaldehydes, melamine formaldehydes and benzoguamine formaldehydes.

Re. 30,235

PHOTOSENSITIVE COLORANT MATERIALS

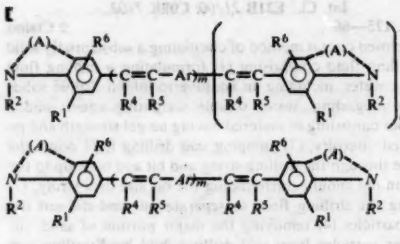
Hal E. Wright, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Original No. 4,012,376, dated Mar. 15, 1977, Ser. No. 645,067, Dec. 29, 1975. Application for reissue Dec. 15, 1978, Ser. No. 970,025

Int. Cl.[2] C07D 401/10

U.S. Cl. 542—447 4 Claims

1. An electrically photosensitive colorant having the formula:



wherein

[n represents 0 or 1;] m represents the integer 1 or 2;

Ar represents a substituted or unsubstituted aromatic ring group, free from any saturated N-heterocyclic ring group fused thereto, having 6 to 20 ring atoms in the aromatic ring;

A represents a substituted or unsubstituted alkylene group having 2 to 5 carbon atoms in the alkylene chain;

each of R^1 and R^2, when taken together, represents a substituted or unsubstituted alkylene group having 2 to 5 carbon atoms in the alkylene chain;

each of R^1, R^4, R^5, and R^6, when taken alone, represents hydrogen, nitro, cyano, halogen, alkoxy having 1 to 8 carbon atoms, substituted or unsubstituted alkyl having 1 to 8 carbon atoms in the alkyl group, substituted or unsubstituted phenyl, carboxy ester having 1 to 4 carbon atoms, or an amide having the formula:

$$-CONR_2^7$$

wherein

R^7 represents hydrogen or substituted or unsubstituted phenyl or substituted or unsubstituted alkyl having 1 to 8 carbon atoms in alkyl group; and

R^2, when taken alone, represents hydrogen, substituted or unsubstituted alkyl having 1 to 8 carbon atoms in the alkyl group, or substituted or unsubstituted aromatic ring group havng 6 to 20 carbon ring atoms.

PLANT PATENTS

GRANTED MARCH 18, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,511

ALGA STRAIN

Mordhay Avron, Rehovot, and Ami Ben-Amotz, Ramat Gan, both of Israel, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 918,802, Jun. 26, 1978. This application Oct. 20, 1978, Ser. No. 955,007

Int. Cl.[2] A01H *13/00*

U.S. Cl. Plt.—89 **1 Claim**

1. A new and distinct variety of alga of the genus Dunaliella, named *Dunaliella bardawil*, substantially as herein shown and described, characterized by the fact that when grown outdoors in a thin layer the cells are bright orange, the cells containing up to 9% dry weight of carotene and up to 50% glycerol.

4,512

MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Dec. 14, 1978, Ser. No. 969,449

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded, much branched habit, substantially as illustrated and described, characterized by buds and flowers which are (1) dark red, similar to Honest Abe (miniature—plant patent pending) in color, the buds and flowers resembling June Time (miniature—U.S. Plant Pat. No. 2,563) in size and shape and (2) the bud (sepals) being lightly covered with short moss, said moss being soft to the touch and further characterized by a plant which is vigorous and compact, easy to propagate from softwood cuttings or by budding, with an abundance of flowers borne singly or several to the stem in loose clusters.

PATENTS

GRANTED MAR. 18, 1980

ERRATA

For CLASS	See PATENT NO.
433–177	4,193,194
433–013	4,193,195
433–082	4,193,196
433–082	4,193,197
433–077	4,193,198
339–098	4,193,201
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368–074	4,193,256
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410–064	4,193,350
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312–280	4,193,652
455–154	4,193,686
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430–300	4,193,798
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430–139	4,193,802
430–353	4,193,804
435–182	4,193,845
260–586 C	4,193,878
548–132	4,193,922
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525–002	4,193,945
424–283	4,194,029
528–067	4,194,035
528–182	4,194,038
546–146	4,194,044
546–209	4,194,045
546–259	4,194,046
548–312	4,194,048
548–336	4,194,049
560–041	4,194,050
560–060	4,194,051
560–155	4,194,052
560–176	4,194,053
562–493	4,194,054
562–503	4,194,055
562–517	4,194,056
585–011	4,194,057
585–455	4,194,058
371–020	4,194,113
455–076	4,194,151
455–031	4,194,152
455–031	4,194,153

ERRATA—Continued

For CLASS	See PATENT NO.
455–114	4,194,154
455–345	4,194,155
455–214	4,194,156
455–348	4,194,157
455–333	4,194,158
455–179	4,194,159

PATENTS

GRANTED MARCH 18, 1980

GENERAL AND MECHANICAL

4,193,132

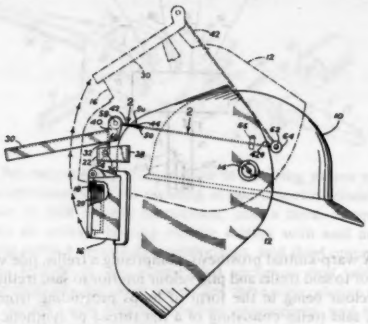
RAIN-SHIELDED WELDER'S MASK

Edwin E. Peterson, 4109 Chenowith, The Dalles, Oreg. 97058

Filed Sep. 25, 1978, Ser. No. 945,552

Int. Cl.[2] A61F *9/06*

U.S. Cl. 2—8 **6 Claims**



1. A rain-shielded welder's mask assembly comprising in combination:

(a) a head piece,

(b) a welder's mask with outwardly projecting eye piece,

(c) first pivotal mounting means releasably attaching the mask to the head piece for relative angular movement between raised inoperative and lowered operative mask positions,

(d) a dished rain shield dimensioned to nest over the eye piece,

(e) a gutter secured to the mask above the eye piece,

(f) pin hinge means connecting the rain shield to the gutter for angular movement between a rain shield raised position in which it extends substantially horizontally above the eye piece when the mask is lowered and a rain shield lowered position in which it nests over the eye piece when the mask is raised,

(g) a lever extending upwardly from the inner end of the rain shield,

(h) a substantially rigid link, and

(i) detachable grommet-type connecting means connecting the respective ends of the link one to the lever and the other to the head piece,

(j) the link extending rearwardly from the rain shield through an opening in the mask and thence rearwardly between the mask and head piece to its rearward connection to the head piece.

4,193,133

DETACHABLE HELMET GOGGLE BRACKET

Friedrich Laibach, Haan, and Paul Hoebink, Solingen, both of Fed. Rep. of Germany, assignors to Fondermann & Co., Haan, Fed. Rep. of Germany

Filed Apr. 10, 1978, Ser. No. 895,198

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1977, 7711402[U]

Int. Cl.[2] A61F *9/00;* **A44B** *11/04*

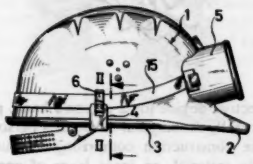
U.S. Cl. 2—10 **10 Claims**

1. A bracket for detachably securing a retaining strap of safety goggles to a safety helmet having a rim projecting laterally about at least a portion of said helmet, said bracket comprising

(a) a resilient U-shaped member having a U-portion and a pair of spaced limbs extending therefrom and adapted to extend about said rim with said U-portion contacting said rim and said limbs extending along the interior and exterior sides of said helmet;

(b) one of said limbs, adapted to extend along the exterior side of said helmet, being bifurcated providing spaced bifurcated ends; and

(c) a clamp lever pivotally mounted between said bifurcated ends of said one limb of said U-shaped member and including at least one elongated arm, said clamp lever defining a passage through which said retaining strap of safety goggles extending about said safety helmet passes;



(d) said clamp lever including said arm being adapted to pivot between an initial position wherein said rim of said safety helmet may be passed between said limbs and into contact with said U-portion of said member and a locking position wherein said one arm is pressed against the exterior side of said helmet and projects towards said U-portion of said member such that said rim of said helmet is retained between the end of said one arm and said U-portion of said member.

4,193,134

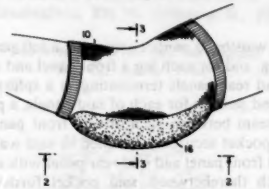
PROTECTIVE DEVICE WITH INTEGRALLY MOLDED PAD

James R. Hanrahan, Fairfield, Conn., and Richard G. Levine, Lawrence, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Mar. 4, 1977, Ser. No. 774,377

Int. Cl.[2] A41D *13/08*

U.S. Cl. 2—16 **6 Claims**



1. A body-protecting pad comprising:

a hydrokinetic sleeve of a knit fabric having an internal hydrophobic yarn and an external surface at least partially comprised of a hydrophilic yarn;

an integral, hydrophilic polyurethane pad molded and foamed in situ into said external surface of said sleeve so as to be bonded to and at least partially embedded in said sleeve;

whereby moisture can be wicked away from the wearer, through the fabric, and into the pad.

4,193,135

PROTECTIVE DEVICE FOR THE HAND

Jhoon G. Rhee, 4068 Rosamora Ct., Arlington, Va. 22207

Filed May 12, 1978, Ser. No. 905,470
Int. Cl.[2] A41D 19/00
U.S. Cl. 2—162 14 Claims

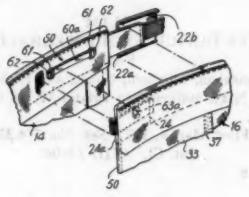
1. A protective device for a person's hand, palm and wrist having a generally rectangular shape of a person's hand and a sandwich-like construction comprising an outer layer of a tough, pliable material, an inner layer of energy absorbing material, and a bendable stiffening member, which is bendable about a palm and wrist, interposed between said outer and inner layers, the peripheral edges of said outer and inner layers being held together and the peripheral edges of said stiffening member disposed near said peripheral edges of said inner and outer layers, said device including securing means for retaining the device on a wearer's hand.

4,193,136

SPLIT WAISTBAND PANTS

Kenney J. Pierce, El Paso, Tex., assignor to Farah Manufacturing Company, Inc., El Paso, Tex.

Filed Mar. 22, 1978, Ser. No. 888,957
Int. Cl.[2] A41F 9/02
U.S. Cl. 2—237 7 Claims



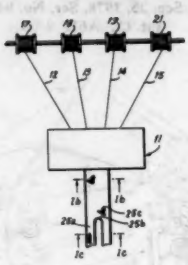
1. A split waistband pants comprising a left pant leg and a right pant leg, and for each leg a front panel and a rear panel, said front and rear panels terminating in a split waistband, a split waistband portion for each of said panels, a pocket along an exterior seam between each of said front panels and rear panels, said pocket securedly attached to said waistband portions for said front panel and said rear panel with a split in said pocket pouch therebetween, said pocket further securedly attached to the front panel of said pant legs and to the rear panel of the pant leg at the side seam thereof, an elastic member in said waistband for said front panel secured at said waistband portion of said rear panel, an elastic member for said rear panel portion of said waistband secured at one end to the waistband portion of said front panel on an interior portion therefor and on the other end thereof terminating in the waistband portion of said waistband for the rear panel thereof, means for an unrestrained slidable attachment of each of said waistband portions for said rear panels and front panels to each other, and means for restricting said slidable attachment from slidably exceeding a predetermined limiting distance.

4,193,137

WARP-KNITTED DOUBLE-VELOUR PROSTHESIS

Rudolf N. Heck, Ringwood, N.J., assignor to Meadox Medicals, Inc., Oakland, N.J.

Filed May 6, 1977, Ser. No. 794,481
Int. Cl.[2] A61F 1/24
U.S. Cl. 3—1.4 19 Claims



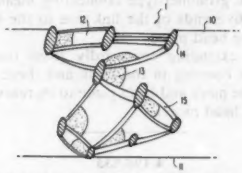
1. A warp-knitted prosthesis, comprising a trellis, pile velour exterior to said trellis and pile velour interior to said trellis, said pile velour being in the form of loops protruding from said trellis, said trellis consisting of a flat thread of synthetic fiber warp-knitted in closed stitch, and said pile velour consisting of a texturized thread of synthetic fiber in open stitch passing through said trellis to form loops interior to and exterior to said trellis, said interior and exterior loops being continuous with each other for facilitating ingrowth of tissue from the exterior of said prosthesis to the interior thereof, the combination of a trellis warp-knitted of flat thread in closed stitch and a velour of texturized thread in open stitch providing minimum porosity, appropriate rigidity for functioning as a prosthesis and extremely fine hand.

4,193,138

COMPOSITE STRUCTURE VASCULAR PROSTHESES

Koichi Okita, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 17, 1977, Ser. No. 825,513
Claims priority, application Japan, Aug. 20, 1976, 51-99808; Jul. 1, 1977, 52-79387
Int. Cl.[2] A61F 1/24
U.S. Cl. 3—1.4 28 Claims



1. A composite structure vascular prosthesis comprising a porous polytetrafluoroethylene tube in which the pores of the porous polytetrafluoroethylene tube are filled with at least one water-insolubilized water-soluble polymer.

4,193,139

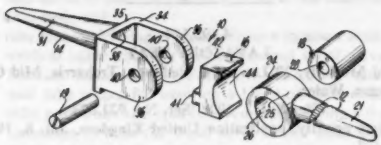
PROSTHETIC FINGER JOINT

Peter S. Walker, Ridgewood, N.J., assignor to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Mar. 8, 1978, Ser. No. 884,786
Int. Cl.[2] A61F 1/24
U.S. Cl. 3—1.91 17 Claims

10. A prosthetic finger joint comprising: a first component

adapted to be associated with a first bone of the finger, said first component having an arcuate bearing surface at one end thereof, said first component including means for allowing said first component to pivot on said bearing surface; a second component adapted to be associated with a second bone adjacent to said first bone, said second component having a terminal portion at one end facing toward said arcuate bearing surface, said terminal portion having rigid wall means defining an open-ended socket, said wall means including means there-



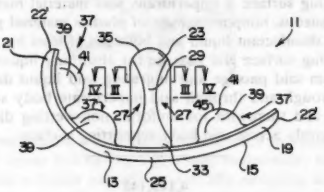
with for cooperating with said pivot allowing means of said first component to allow pivoting of said first component with respect to said second component; and a third component having an arcuate bearing surface mating with said arcuate bearing surface on said first component, said third component fixedly located in said open-ended socket so that said wall means embraces the same and so that there is no relative movement between said second and third components, said mating bearing surfaces cooperating to carry the loading forces of said finger joint in use.

4,193,140

KNEE PROSTHESIS

Harry T. Treace, Forest Hill, Tenn., assignor to Richards Manufacturing Company, Inc., Memphis, Tenn.

Filed Dec. 19, 1975, Ser. No. 642,369
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.911 **2 Claims**



1. A knee prosthesis for implanting with cement in a human knee comprising:

(a) a single curved elongated body portion having upper and lower surfaces, and having posterior and anterior ends;

(b) single post means fixedly attached to said curved body portion intermediate said posterior and anterior ends and extending generally upwardly from said upper surface for interaction with the cement with which used to resist in and of itself all twisting forces which might be encountered in the use of the prosthesis and to resist tension and compression forces, said post means in cross section along a substantial portion of the length thereof is cross shaped and said post means is of a reduced size in cross-sectional area at a midportion halfway between the upper and lower ends thereof, and with said post means increasing in cross-sectional size from said midportion towards said upper and lower ends; and

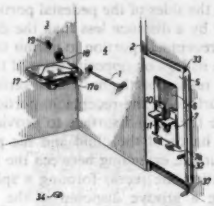
(c) at least one cement holding means of less height than said post, fixedly attached to said body portion and extending in a direction generally remote from said lower surface for interaction with the cement with which used to provide support to said body portion and to resist tension and compression forces along a substantial portion of the length of said body portion.

4,193,141

REST ROOM, ESPECIALLY FOR DISABLED PERSONS

Ralf H. S. Rosenberg, and Morgan H. O. Ferm, both of Göteborg, Sweden, assignors to Ifo Sanitar AB, Bromolla, Sweden

Filed Sep. 25, 1978, Ser. No. 945,712
Claims priority, application Sweden, Sep. 28, 1977, 7710825
Int. Cl.² A47K *17/00, 3/22, 11/08*
U.S. Cl. 4—1 **4 Claims**



1. A restroom for disabled persons comprising:

(a) a first wall;

(b) a sanitary fixture (**17**);

(c) a seat carried by said first wall;

(d) a hand shower nozzle;

(e) said first wall comprising means for selectively positioning said seat in an upper vertical and a lower horizontal position;

(f) said seat further comprising a central opening (**10**) to form a bidet in said lower horizontal position allowing the introduction of said hand shower into the space below said opening;

(g) said seat further comprising a cross-member (**11**) projecting into said room when said seat is in said upper vertical position;

(h) said cross-member having a support surface adapted to support a semi-sitting person; and

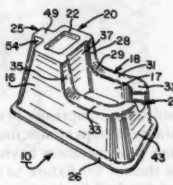
(i) said first wall having means attached thereto for swinging said first wall about a vertical axis between a first position permiting a disabled person to sit on or rise from said seat, and a second position whereat said seat is opposite said sanitary fixture.

4,193,142

CHILD'S TOILET APPARATUS

Bernadine Henningfield, 326 W. Jefferson St., Elkhorn, Wis. 53121

Filed Sep. 25, 1978, Ser. No. 945,227
Int. Cl.² A47K *11/02*
U.S. Cl. 4—141 **4 Claims**



1. A child's toilet apparatus comprising a body having an axis of elongation and a base defining a first plane adapted to rest upon a horizontal surface, said body having a pedestal portion at one end extending from the first plane to a first

surface disposed in a second plane parallel to the first plane and a receptacle portion at the other end extending from the first plane to a second surface disposed in a third plane parallel to the first plane, said third plane being disposed between the first and second planes, the second surface being provided with a recess extending therein to form a receptacle portion, said receptacle having spaced opposite walls generally parallel to the axis of elongation of the body extending between the base and the second surface, whereby the second surface forms seat portions on opposite sides of the receptacle for supporting the child, the pedestal portion extending from the receptacle portion and having spaced opposite sides generally parallel to the axis of elongation of the body extending between the base and the first surface, the sides of the pedestal portion being spaced from each other by a distance less than the distance between the walls of the receptacle portion to permit the child to comfortably position its legs on opposite sides of the pedestal portion with its feet resting on the horizontal surface while sitting on the second surface of the receptacle portion, the first surface being above the second surface to provide a convenient position for the hands of the child and the pedestal portion having a third surface extending between the first and second surfaces confronting the recess forming a splash guard; and further including a groove disposed in the second surface extending from the receptacle on the side thereof opposite the pedestal portion to form a pouring spout; and further including handle means disposed on the pedestal portion of said body to facilitate pouring operations; and wherein said handle means is in the form of an outwardly projecting flange on said pedestal portion having a pair of finger hold recesses on opposite sides thereof; and further including a recess in the upper surface of said pedestal portion for storing and supporting articles of amusement; and wherein said flange includes a pair of side parallel spaced apart portions extending from said pedestal portion rearwardly and inclined gradually upwardly therefrom.

4,193,143

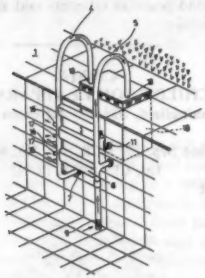
SWIMMING POOL STEPS AND WATER CIRCULATING ARRANGEMENT FOR SWIMMING POOLS

Claudio Werneck De Carvalho Vianna, Rua Santa Alexandrina, 900 Apt. 101, Rio Comprido Rio de Janeiro, Brazil

Filed Oct. 27, 1977, Ser. No. 846,097

Int. Cl.[2] **E04H** *3/20*

U.S. Cl. 4—172.17 **5 Claims**



1. Swimming pool steps comprising first and second lateral handrails and a plurality of steps connecting said handrails, said handrails comprising pipe members having respective return curves at first ends thereof for fixture to the edge of a swimming pool, said first handrail having a second lower end provided with a telescopically fitted sleeve to adjust the length of said first handrail so that said lower end abuts the bottom of the pool, said sleeve being provided with orifice means adjacent its free end, said second handrail having a closed lower end and, along the mid-section thereof, first and second series of ports, said first series being laterally directed away from said steps in a horizontal direction substantially in a plane defined by said plurality of steps, said first ends of said first and second handrails being connected respectively to suction and pressure lines of pump-filter-purifier unit means, each port of each series being below the uppermost of level of water in the pool, the ports of said second series being distributed along said midsection of said second handrail between said ports of said first series and at a forward angle of approximately 45° with respect thereto, said ports of said second series being of smaller diameter than said first series of ports.

4,193,144

LAVATORY SEAT

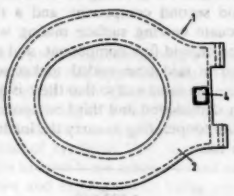
Ronald McNally, 29 Lewis St., Bedlinog, Treharris, Mid Glamorgan, Wales

Filed Jul. 3, 1978, Ser. No. 921,673

Claims priority, application United Kingdom, Jul. 6, 1977, 28201/77

Int. Cl.[2] **A47K** *13/00, 13/30*

U.S. Cl. 4—229 **4 Claims**



1. A lavatory seat having an outer surface including a body supporting surface and a surface for resting adjacent a lavatory bowl when the body supporting surface is supporting a body, a mass of material forming said outer surface and means defining a disinfectant passage communicating with said mass of material, the improvement being comprised in that said body supporting surface is imperforate, said material mass being a homogeneous, nonporous mass of plastics material permeable by said disinfectant liquid and bounded at least by said body supporting surface and passage for absorbing liquid disinfectant from said passage and migrating said liquid disinfectant therethrough and through said imperforate body supporting surface and therewith for uniform, non-wetting disinfection continuously across said body supporting surface.

4,193,145

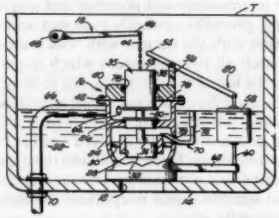
TOILET FLUSHING VALVE MECHANISM

Gary Gross, and James F. Thies, both of N. Hollywood, Calif., assignors to Garon Processing Co., North Hollywood, Calif.

Filed Jun. 29, 1978, Ser. No. 920,570

Int. Cl.[2] **E03D** *1/36;* **F16K** *31/18*

U.S. Cl. 4—346 **3 Claims**



1. A toilet flushing valve mechanism for use in a tank connected to a source of flushing fluid under pressure, and defining an outlet to a bowl, comprising:

a housing defining an inlet port adapted to be connected to

said source of flushing fluid and further defining a vertical valve chamber extending transverse to said inlet port, said chamber being coupled through said outlet to said bowl;

a multiple land spool valve positioned in said valve chamber and having spaced apart land means with said inlet port coupled to the space therebetween, one of said lands for mating with said chamber to close said outlet to said bowl;

activating means for displacing said spool valve to open said outlet to said bowl;

float means in said tank for moving said spool valve to close said outlet to said bowl under control of the water level in said tank; and

a tube means, defining a passage from a location inside said vertical valve chamber and below said spool valve to a location outside said vertical valve chamber in said tank, said tube means for carrying a bleed-off flow from said inlet port when said spool valve is open during a flushing operation to raise the water level in said tank, said tube further defining an opening outside said vertical valve chamber at the normal water level in said tank to after fill said toilet with water from said tank received therein through the tube means during the flushing operation.

4,193,146

BUNK BED LADDER BRACKET

Harry Fredman, and Irving N. Fredman, both of 908 SW. Washington, Peoria, Ill. 61602

Filed Apr. 13, 1978, Ser. No. 896,205
Int. Cl.[2] E06C 1/36
U.S. Cl. 5—8 **10 Claims**

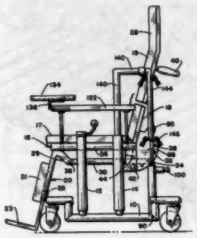
1. In combination with a bunk bed assembly including a leg supported upper bed having a generally horizontally disposed bed rail and a ladder extending vertically alongside the bunk bed assembly to enable access to the upper bed, that improvement comprising bracket means supporting the ladder from the bed rail, said bracket means including means engaging the upper edge of the bed rail and means engaging the lower edge of the bed rail to prevent accidental disengagement of the ladder from the bed rail and to prevent longitudinal sliding movement of the ladder in relation to the bed rail, said bracket means including a separate bracket structure mounted on each stile of the ladder, said means engaging the upper edge of the bed rail including a terminal end of a bracket strap overlying the top edge and engaging the inner surface of a vertical flange of a right angled bed rail, the means engaging the bottom edge of the bed rail including a strap having a hook-shaped end engaging the inner edge of the horizontal flange of the bed rail and an opposite end connected with the stile of the ladder to prevent relative vertical movement between the ladder and rail and prevent relative twisting between the ladder and rail, said strap engaged with the vertical flange of the rail extends to a point below the rail with the strap engaging the lower flange of the rail being secured to the lower portion of the vertical strap, said vertical strap including two offset portions disposed at different vertical levels for engaging the bottom flange of two different size bed rails, said offset portions having fastener receiving means thereon at two laterally spaced positions to enable the horizontal strap to engage with two different size bed rails.

4,193,147

CANTILEVERED LIFTING AND TRANSPORTING DEVICE

Edwin L. Fischer, 22035 W. Carbon Mesa Rd., Malibu, Calif. 90265

Filed Jul. 10, 1978, Ser. No. 922,940
Int. Cl.[2] A61G 5/00
U.S. Cl. 5—81 R **17 Claims**



1. A convertible lifting and transporting device comprising:

a U-shaped base having the ends joined by one side;

a pair of vertical supports mounted on said one side;

a horizontal frame attached to said vertical supports having a seat;

a back rest rotatably mounted on one side of said seat;

a leg rest rotatably mounted on the other side of said seat;

said vertical supports including means for raising and lowering said horizontal frame, back rest and leg rest;

rotatable means rotatably joining the back rest to the leg rest whereby said back and leg rests may be simultaneously rotated from a substantially vertical position to a horizontal position parallel with said seat to form a stretcher; and

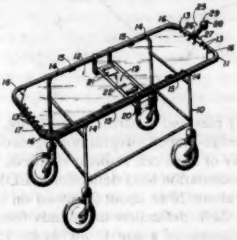
lock means for locking said lifting and transporting device in the upright or flat position.

4,193,148

TRANSPARENT RADIATION PENETRABLE STRETCHER PANEL

Charlie D. Rush, Rte. 4, Box 324E, Albany, Ga. 31701

Filed Aug. 21, 1978, Ser. No. 935,626
Int. Cl.[2] A61G 7/10
U.S. Cl. 5—86 **9 Claims**



7. A combined stretcher and x-ray examination table for emergency patients comprising in combination a wheeled stretcher base, an upper horizontal stretcher frame detachably secured to said base, and a light transparent and radiation penetrable patient support panel secured to and held taut within the confines of the upper stretcher frame and being

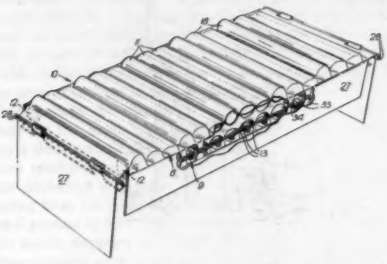
liftable as a unit with said stretcher frame; whereby said patient may be visually observed through said panel.

4,193,149

BEDS AND MATTRESSES

Robert J. D. Welch, 20 Abercorn Pl., St. John's Wood, London NW. 8, England

Filed Mar. 27, 1978, Ser. No. 890,459
Claims priority, application United Kingdom, Mar. 29, 1977, 13223/77
Int. Cl.[2] A61H *1/00*; A61G *7/10*
U.S. Cl. 5—447 14 Claims



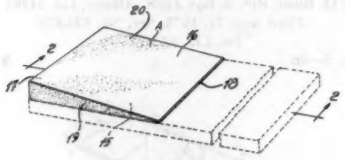
1. A mattress comprising a plurality of inflatable tubes each of which extends across the mattress, said tubes being arranged in at least two layers wherein the tubes of each said layer are in side by side arrangement and said tubes of each said layer are divided into a plurality of arrays so that all the tubes of each respective array are inflatable in common and, means for aligning the tube of the respective layer of tubes such that the tube in use, are disposed in substantial vertical alignment with the tubes of in another layer.

4,193,150

ELEVATED MATTRESS

Arthur Vineberg, 3170 Delavigne, Montreal, Quebec, Canada

Filed Jul. 21, 1978, Ser. No. 926,634
Claims priority, application Canada, Aug. 4, 1977, 284083
Int. Cl.[2] A47G *9/00*; A61G *7/06*; A47C *27/14*
U.S. Cl. 5—431 3 Claims



1. An auxiliary elevated mattress, comprising,

a one piece wedge-shaped integral homogeneous supportive body entirely of open cell resilient synthetic resin foam of which the indentation load deflection (ILD) is within the range from about 20 to about 26 based on the pounds of force for a 25% deflection in pounds force per 50 sq. inches in a sample of a size 15 inches by 15 inches by 4 inches,

said body having, extending from a head end to a foot end, a planar rectangular base surface of which the length is in the range from about 32 inches to about 42 inches, and an uninterrupted planar load-receiving surface diverging therefrom at an acute angle, a major planar head end surface having a height from about 6½ to about 5⅞ inches extending from the base surface to the load-bearing surface and a minor foot end surface having a height not greater than about one-half inch extending perpendicularly from the base surface to the load-bearing surface,

the base and load-receiving surfaces having substantially the width of a normal mattress, the length and inclination of the load-receiving surface being such as to support the head, neck and thorax of a patient reclining on the mattress with the crease in his buttocks near the foot end,

the entire base and load-supporting surfaces being of exposed raw foam whose open cells provide resistance to slippage,

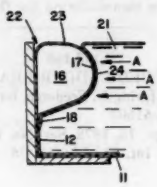
the body being deflectable from about 23% to about 27% under the weight of the reclining patient.

4,193,151

WATERBED SAFETY LINER

David Calleance, 1945 - 23rd Ave., San Francisco, Calif. 94116

Filed Jul. 24, 1978, Ser. No. 927,299
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—452 9 Claims



1. In a waterbed including a liquid filled bladder disposed within a supporting frame; an improved safety liner comprising a base sheet extending beneath the bladder, sidewalls extending inwardly from said base sheet and forming a coffer containing the bladder, and an inflatable chamber joined to said sidewalls and extending continuously about said coffer, said inflatable chamber including inner and lower side portions disposed superjacently of the periphery of said bladder and being buoyantly supported thereby, such that said inflatable chamber is surrounded on two sides by said bladder.

4,193,152

CLOSEABLE PILLOW, TOTE BAG AND THE LIKE

Charles R. Seibold, Jr., 202 Post & Rail Rd., Longwood, Fla. 32750

Filed Mar. 1, 1978, Ser. No. 882,414
Int. Cl.[2] A47G *9/00*; A61G *7/06*
U.S. Cl. 5—490 7 Claims

1. In a casing, a length of cloth-like material, a pair of Velcro strips secured at each end of the material with the locking face disposed downwardly and with the material on the top thereof, folding the material in the center to have the Velcro strips on the top of each other with the locking faces disposed outwardly, securing the side edges of the material together up to the ends of the Velcro strips, turning the resulting casing inside out with the Velcro strips in position to lockingly engage each

other to close the open end of the casing, and means for securing the side edges of the Velcro strips in sealed relation to each other and the side edges of the casing.

4,193,153

LIFE JACKET

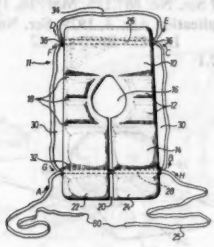
Andrew C. R. Tyrer, 144, Rupert Rd., Huyton, Liverpool L36 9TH, England, and David G. Lace, Wigan, England, assignors to R. Perry & Company Limited, Merseyside and Andrew Charles Ratcliffe Tyrer, Liverpool, both of, England

Filed Jun. 19, 1978, Ser. No. 916,754

Claims priority, application United Kingdom, Mar. 28, 1978, 11938/78

Int. Cl.[2] B63C *9/10*

U.S. Cl. 9—342 **19 Claims**



1. A lifejacket comprising a one-piece body member of moulded, flexible, plastic foam which includes a shoulder portion coupled to a headrest portion and to a chest portion so that when the lifejacket is in its initial unstressed state, the headrest, shoulder and chest portions are substantially coplanar, said shoulder portion defining a neck aperture, said chest portion defining a longitudinal slit which extends through from said neck aperture thereby dividing the chest portion into two similar parts, means defining a transverse bore through said headrest portion and a transverse bore through said chest portion and a one-piece tape having two free ends which pass through said transverse bores for securing the lifejacket to a wearer, the tape being threaded from a first side of the body member through said second bore in the chest portion, then through a first bore in the headrest portion from the other side of the body member, then again through said second bore in the chest portion from the first side of the member so that said two free ends of the tape extend from opposite ends of said second bore, respectively.

15. A method of manufacturing a lifejacket, which comprises a one piece body member of moulded, flexible, plastics foam which includes a shoulder portion coupled to a headrest portion and to a chest portion, means defining a neck aperture in the shoulder portion, means defining a longitudinal slit which extends through the chest portion from said neck aperture thereby dividing the chest portion into two similar parts, means defining at least two longitudinally spaced transverse bores in said headrest and chest portions, and a one piece tape which passes through said at least two longitudinally spaced transverse bores for securing the lifejacket to a wearer, said method comprising the steps of heating sheets of foam until a thermo laminable state is achieved, assembling said sheets in layers in a mould which is open around the outside but closed about an internal rim, whereby said neck aperture can be formed, subsequent compression of said mould allowing thermo-forming of the foam to take place until the jacket is cool, forming said transverse bores through the jacket and then threading said tape therethrough.

4,193,154

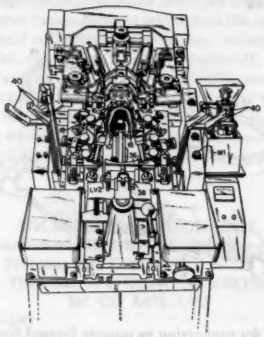
TOE PULLING OVER AND LASTING MACHINE

Michael M. Becka, Nashua, N.H., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Aug. 25, 1978, Ser. No. 936,998

Int. Cl.[2] A43D *21/00*

U.S. Cl. 12—10.1 **1 Claim**



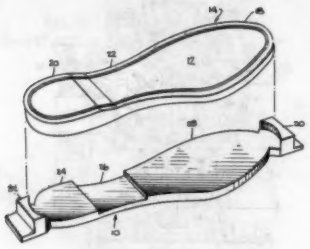
1. A toe pulling over and lasting machine operable on a shoe assembly that includes a last having an insole located on its bottom and an upper mounted thereon comprising: a support for supporting the shoe assembly bottom-down; a toe pincers operable to grip the upper margin proximate to its toe end extremity; at least one side pincers located on each side of and forwardly of the toe pincers operable to grip the upper margin heelwardly of the portion of the upper margin gripped by the toe pincers; upper stretching means for effecting relative upward movement of the support with respect to the toe and side pincers to stretch the toe portion of the upper about the last; optionally operable pincers adjusting means for thereafter selectively adjusting each of the pincers heightwise to relocate the stretched upper about the last; wiping means actuable to wipe the toe portion of the upper margin against the insole; circuit means for causing the machine to first go through a preliminary stage wherein the toe pincers are actuated to grip the upper margin, then go through a primary stage wherein the side pincers are actuated to grip the upper margin and the upper stretching means is actuated, and then go through a secondary stage that is concluded by actuation of the wiping means; a control for operating the circuit means as aforesaid; a selector movable between a first position and a second position; and circuitry so connecting the control, the circuit means, and the selector that when the selector is in its first position a first actuation of the control causes the machine to go through said preliminary stage after which the machine comes to a halt to enable the operator to place the upper margin properly in the side pincers, a second actuation of the control causes the machine to go through said primary stage and then come to a halt to enable actuation of the pincers adjusting means, and a third actuation of the control causes the machine to go through the secondary stage, and that when the selector is in its second position a first actuation of the control causes the machine to go through said preliminary stage and then come to a halt and a second actuation of the control causes the machine to automatically go through the primary stage and the secondary stage without coming to a halt between the primary stage and the secondary stage; characterized in that the selector is movable into a third position and said circuitry so connects the control, the circuit means and the selector that when the selector is in its third position a single actuation of the control causes the machine to automatically go through the preliminary stage, the primary stage and the secondary stage without coming to a halt between any of these stages.

4,193,155

ANVIL FOR OUTSOLE SLITTING

John F. Borisuck, Naugatuck; William L. Coviello, Waterbury, and Gary W. Sheedy, Naugatuck, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Nov. 22, 1977, Ser. No. 853,936
Int. Cl.[2] A43D *43/04*; B26D *7/20*
U.S. Cl. 12—40 **7 Claims**



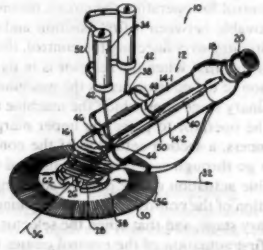
1. An anvil for supporting an outsole formed from an elastomeric compound having a heel portion thicker than the sole portion during a process of imparting a multiplicity of slits to the outer surface of the heel and sole portions of said outsole, said anvil being substantially flat over most of its length, and having a sole portion and a heel portion, the sole portion extending to a greater height than the heel portion of the anvil, whereby the multiplicity of slits may be imparted to said outsole heel and sole portions by a single reciprocating cutting blade in one continuous operation without removing the outsole from the anvil or changing the position of the outsole on said anvil.

4,193,156

APPARATUS FOR CLEANING SUBMERGED SURFACES

Fernand L. O. J. Chauvier, Springs, South Africa, assignor to Daniel Jean Velere Denis Chauvier, Dunnottar, South Africa

Division of Ser. No. 823,757, Aug. 11, 1977, Pat. No. 4,156,948.
This application Nov. 24, 1978, Ser. No. 963,529
Claims priority, application South Africa, Aug. 19, 1976, 76/4992; Oct. 13, 1976, 76/6105
Int. Cl.[2] E04H *3/20*
U.S. Cl. 15—1.7 **1 Claim**



1. A flexible disc for a cleaning head of an apparatus that cleans a surface submerged in a liquid, said cleaning head including a mouth engageable with the surface to be cleaned, said disc comprising

a substantially planar member fabricated from a resiliently flexible material, said member including a central aperture within which said cleaning head is receivable for detachably interconnecting said disc and said cleaning head,

a series of concertina-like folds in an outer annular portion of said disc, said concertina-like folds extending radially outward relative to said central aperture, and said concertina-like folds permitting the outer periphery of said disc to be resiliently extensible around the outer periphery of said disc, and

a series of grooves in one surface of said disc which extend from the outer periphery of said disc through said outer annular portion into an inner annular portion of said disc, said grooves also extending radially outward relative to said central aperture, and said grooves being located in that disc surface adapted to engage the surface to be cleaned,

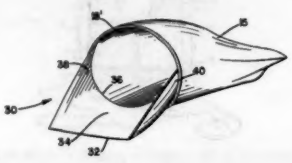
said flexible disc cooperating with said cleaning head during use of said apparatus for retaining said mouth in cleaning proximity with the surface to be cleaned and for assisting in removal of dirt from that surface.

4,193,157

BAG SPREADER

Helen F. Large, 25 A Center St., Rumson, N.J. 07760

Continuation of Ser. No. 887,125, Mar. 16, 1978, abandoned.
This application Apr. 4, 1979, Ser. No. 26,821
Int. Cl.[2] B65B *67/12*
U.S. Cl. 15—257.1 **7 Claims**



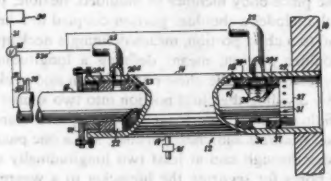
1. A spreader for temporarily holding open the mouth of a flexible bag so as to facilitate the gathering of leaves or other debris into the bag comprising: a relatively rigid, closed circle hoop stiff enough to be shape retaining about which the opened mouth of a bag may be placed; and ground penetration means affixed to said hoop and extending laterally, outwardly therefrom, whereby said hoop may be oriented upright with respect to the ground and said ground engaging means forced into the ground to stabilize said hoop and hold the open bag in a desired orientation during introduction of said debris.

4,193,158

SOOT BLOWER FOR PRESSURIZED FURNACE

Henry J. Blaskowski, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 5, 1979, Ser. No. 1,342
Int. Cl.[2] F23J *3/00*; F27D *23/00*
U.S. Cl. 15—317 **9 Claims**



1. A soot blower for removal of slag from the walls of a reactor containing pressurized gases, said soot blower comprising a conduit affixed to a wall of the reactor and adapted to extend outward therefrom, a second conduit concentrically positioned within the first conduit to provide an annular space therebetween, means supporting the second conduit for longitudinal movement within the first conduit, a cylindrical head

affixed to an end of the second conduit having an imperforate end face with an apertured cylindrical periphery that is adapted to lie adjacent the inner cylindrical wall of the first cylindrical conduit, a source of pressurized fluid, means connecting the source of pressurized fluid to the second conduit for exhaust from the apertures of the cylindrical head, means for moving the second conduit longitudinally within the first conduit to move the apertured head into the reactor and exhaust fluid therefrom, and means for supplying a quantity of pressurized fluid to the annular space that lies between the first and second conduits to exclude foreign matter therefrom.

4,193,159

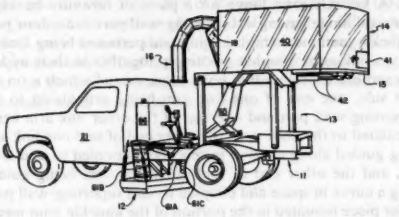
MOBILE CLEANING APPARATUS FOR REMOVING DEBRIS FROM THE SURFACE OF PARKING LOTS AND THE LIKE

Benjamin F. Beard, III, P.O. Box 22106, Charlotte, N.C. 28222

Continuation-in-part of Ser. No. 871,034, Jan. 20, 1978, abandoned. This application May 9, 1979, Ser. No. 37,480

Int. Cl.[2] E01H *1/08*

U.S. Cl. 15—340 **20 Claims**



10. A mobile cleaning apparatus for pneumatically removing debris from the surface of parking lots and the like, comprising:

a mobile vehicle chassis;

a pickup head for collecting debis comprising outwardly extending and opposing arms having an air pressure port adjacent to the free end of each opposing arm for impinging air onto the surface to be cleaned and a vacuum port in said pickup head at the juncture of said opposing arms for removing dirt and debris from said pickup head, said pickup head being transversely carried by said vehicle chassis at a predetermined spaced relationship from the surface to be cleaned and with said opposing arms thereof being swept forwardly in the direction of forward travel of said vehicle chassis;

a hydraulically actuated bell and crank for vertically adjusting said pickup head, said bell and crank being carried by said vehicle chassis and operatively connected to said pickup head for vertically adjusting said pickup head to a predetermined distance from the surface to be cleaned;

collection hopper means movably mounted on said vehicle chassis and having a hydraulically actuated door in the bottom thereof;

a bifurcated pneumatic pressure duct having a leg thereof extending to and communicating with said air pressure port in each opposing arm of said pickup head, said pressure duct extending from said pickup head to said collection hopper means with said legs thereof being joined at the end remote from said pickup head;

a pneumatic vacuum duct connected to and communicating with said vacuum port of said pickup head, said vacuum duct extending from said pickup head to said collection hopper means;

an inverted, conical filter screen having a hydraulically driven fan positioned therewithin disposed in said collection hopper means so as to pull an air current through said filter screen, said fan communicating with the upstream end of said pressure duct and with the downstream end of said vacuum duct through said screen for creating a partially regenerated air current through said pressure duct to said pickup head for entraining debris from the surface beneath said pickup head into the air current formed therein and a suction current through said vacuum duct from said pickup head for transporting the entrained debris to said collection hopper means; and

means for raising said collection hopper means to a predetermined rearwardly raised position so that said bottom door may be opened and the debris collected within said collection hopper means dumped into a trash bin, said means for raising said collection hopper means including a pluality of parallel, rigid support legs of substantially equal length, each of said support legs being pivotally connected at one end thereof to said vehicle chassis and at the other end thereof to said collection hopper means, and a hydraulic ram lift means carried by said vehicle chassis and operatively connected to said collection hopper means.

4,193,160

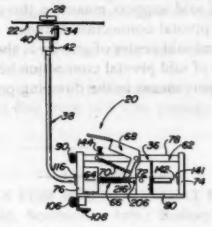
SOLDER EVACUATION UNIT

Harold F. Vandermark, Blue Bell, Pa., assignor to Nu-Concept Computer Systems, Inc., Colmar, Pa.

Filed Oct. 7, 1977, Ser. No. 840,190

Int. Cl.[2] A47L *5/02*

U.S. Cl. 15—341 **8 Claims**



1. Apparatus for simultaneously evacuating molten solder from plural holes in a printed circuit board comprising hollow cup means for contacting said circuit board, said cup means including a resilient lip forming a mouth for the interior of said cup means, the entire periphery of said lip contacting and intimately engaging the circuit board to completely encircle the molten solder area and seal said area with said mouth, thereby isolating the molten solder area from the ambient atmosphere, and vacuum generating means for instantaneously generating a vacuum in response to actuation, said vacuum generating means being in communication with said cup means to instantaneously produce a vacuum within said cup means to thereby pull the molten solder from said holes into said cup means.

4,193,161

VACUUM APPARATUS WITH TILTING CONTAINER

Robert G. Scott, Lemont, Ill., assignor to American Cleaning Equipment Corporation of Illinois, Addison, Ill.

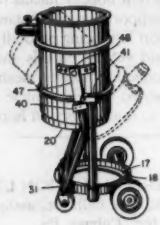
Filed Nov. 24, 1978, Ser. No. 963,316

Int. Cl.[2] A47L *9/00*

U.S. Cl. 15—352 **4 Claims**

1. In a vacuum apparatus including a container and a power unit removably mounted to the top of the container, the improvement comprising: a base provided with support wheels; support means extending upwardly of said base and defining first and second vertical axes spaced on either side of said container; a handle of generally inverted U-shape and defining lower portions aligned coaxially with said support means and extending upwardly and rearwardly therefrom when said handle is in a use position; first connecting means for pivotally connecting the ends of said handle to said support means at a position laterally offset relative to said axes of said support

means while permitting said handle to be rotated between a use position in which said handle extends above said container and a dumping position in which said handle is rotated approximately 180° from said use position; and second connecting means for pivotally connecting said handle to said container at a location below the pivotal connection of said handle to said support means when said handle is in said use position, the pivotal connections between said handle and said container



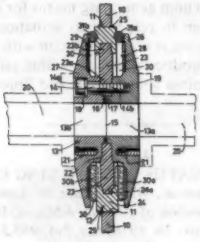
defining a horizontal axis intersecting with the vertical axes of said support means in the use position; whereby the center of gravity of the container and its contents is generally aligned with the axes of said support means in the use position and offset from said pivotal connection between said handle and support means, and said center of gravity is also laterally offset to the other side of said pivotal connection between said handle and said support means in the dumping position.

4,193,162

FLEXIBLE BUSHINGS

Steinar Larssen, Helldal, Norway, assignor to Patents and Developments A/S, Helldal, Norway

Filed Oct. 20, 1977, Ser. No. 843,885
Int. Cl.² F16L 5/00
U.S. Cl. 16—2 **17 Claims**



1. A pipe bushing comprising

a pair of disc-shaped steel parts fastened together along an inner annular joint surface;

an elastically yielding annular disc-shaped element clamped between said parts outwardly of said joint surface;

a steel ring concentric to and secured to said element; said ring being disposed between said steel parts to define a slot between each steel part, said steel ring and said element; and

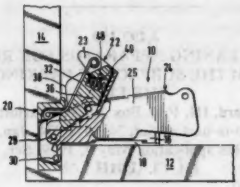
barrier-forming means bordering said slot for filling each slot in response to heating of said means.

4,193,163

KNUCKLE JOINT HINGE

Reinhard Lautenschläger, Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschlager KG, Mobelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 902,059
Claims priority, application Fed. Rep. of Germany, May 13, 1977, 2721620
Int. Cl.² E05D 11/00
U.S. Cl. 16—137 **15 Claims**



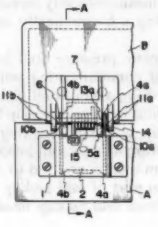
1. A knuckle joint hinge for a piece of furniture having a door, said hinge having a supporting-wall part and a door part, a knuckle joint mechanism joining said parts and being formed by two link arms coupled pivotingly together in their middle area and each forming two lever arms, one of which is on the door side, one end of one link arm being articulated to the supporting-wall part and one end of the other link arm being articulated to the door part, the other end of said one link arm being guided along a curve in space and coupled to said door part, and the other end of said other link arm being guided along a curve in space and coupled to said suporting-wall part, a filler piece mounted in the portion of the knuckle joint mechanism formed by the door-side lever arms of the link arms facing said door part so as to be variable in position, and a pre-tensioned spring biasing said filler piece into a position covering the variable gaps which form between the door-side lever arms and between the lever arms and the door during the opening and closing movement of the hinge, and a cam associated with said filler piece, said filler piece supporting itself against one of said door and door part, by means of said cam on the side of the filler piece facing the door.

4,193,164

REAR HINGE FOR HOLDING LID OF RECORD PLAYER TO CONSOLE

Hirohumi Okayama, Yokohoma, Japan, assignor to Kato Electric and Machinery Co., Ltd, Kanagawa, Japan

Filed May 24, 1978, Ser. No. 909,011
Claims priority, application Japan, Jun. 10, 1977, 52-76287[U]
Int. Cl.² E05D 11/08
U.S. Cl. 16—141 **7 Claims**



1. A rear hinge arrangement for holding the lid of a console, said console having a lock plate (1) affixed to the rear top portion thereof and said lock plate (1) having a defined receptacle portion to receive and hold a component of an attaching member of the rear hinge, said rear hinge comprising in combination:

(a) an attaching member (2) with an insert component designed to enter and be held by the defined receptacle portion of a lock plate (1), and, an outer section extending out of said receptacle portion, a pair of first and second side plates (4*a*, 4*b*) on said attaching member (2), and extending at least from said outer section, said side plates (4*a*, 4*b*) having a juxtapositioned first set of opposite axial apertures;

(b) a rectangular supporting member (7) with a defined rear part, including a pair of second side plates (11*a*, 11*b*) likewise with a pair of juxtapositioned opposite axial apertures, for positioning alongside said first side plates in axial alignment therewith, and, a hollow receiving portion (8) in said rear part, for receiving and holding a lid;

(c) a hinge pin (6) passing through said first and second sets of apertures, weak spring means (15) disposed around said hinge pin (6) and engaging said supporting member (7) biasing said supporting member (7) towards an open position; and,

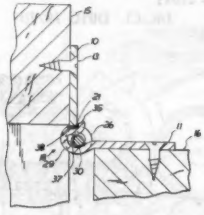
(d) matching concave or convex recesses (5*a*, 5*b*, 13*a*, 13*b*) in at least one of the side plates of the first pair of side plates (4*a*) and the one of the pair of the second side plates (11*a*) adjacent to the one side plate of the first pair of side plates (4*a*), said recesses extending radially on diametrically opposite sides of said first and second apertures at an angle to the horizontal corresponding to an angle at which the console lid is to remain partly open.

4,193,165

HINGE CONSTRUCTION

Joseph J. Malacheski, and Richard J. Zenda, both of 32 Warner St., Plains, Pa. 18705

Filed Oct. 11, 1978, Ser. No. 950,366
Int. Cl.[2] E05D *11/06*
U.S. Cl. 16—191 **10 Claims**



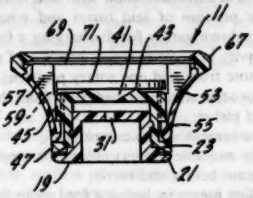
1. A hinge construction composed of two cooperating hinge leaves provided with outwardly projecting knuckles with pin-receiving passages, said knuckles integral with and arranged alternately with openings along the entire length of one side margin of said leaves, at least one retention means integral with and projecting from at least one said leaf and comprised of an arcuated member which is in resilient registration with a deflector, said member having a radius increasingly greater than and outside of the circumference of said knuckles, said knuckles interfitting with said openings to align said passages and said retention means to receive a pivotal pin to pivotally interconnect said leaves, a retention furrow to resiliently engage and disengage said deflector comprised of a side margin of a said opening, and stop means to limit movement of a said leaf.

4,193,166

KNOB FOR A PAN COVER

Paul C. Neff, Antioch, Ill., assignor to Northwest Molded Products Corporation, Waukegan, Ill.

Filed Aug. 7, 1978, Ser. No. 931,935
Int. Cl.[2] A47B *95/02*
U.S. Cl. 16—121 **5 Claims**



1. A knob for the cover of a pan used for waterless cooking, including:

means for mounting said knob in an opening formed in the pan cover,

a vent passage outlet,

a vent passage extending through said mounting means and connecting said pan cover opening with said vent passage outlet,

means to selectively open and close said vent passage outlet which means includes:

a disc for closing said vent passage outlet, and

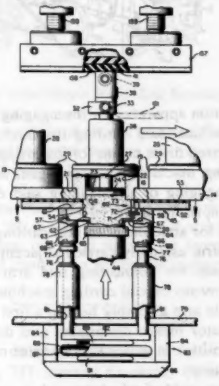
means to lift said disc from said vent passage outlet to open said outlet.

4,193,167

APPARATUS FOR MOLDING MEAT PATTIES

Gerald J. Orlowski, Scottsdale, Ariz.; Rodney D. Wicklund, Denver, Colo.; Richard D. Sandlas, Littleton, Colo., and Walter W. Weibler, Arvada, Colo., assignors to Armour and Company, Phoenix, Ariz.

Filed Nov. 9, 1978, Ser. No. 959,384
Int. Cl.[2] A22C *7/00*
U.S. Cl. 17—32 **29 Claims**



1. In an apparatus for forming patties from a mass of agglomerable edible material such as meat; said apparatus comprising a turret mounted for rotation on a vertical axis and having a plurality of cavities, each cavity having a piston reciprocably mounted therein and each piston having a bottom surface cooperating with the cavity to define a patty-forming mold with a bottom opening;

feeding means cooperating with said turret for moving said

edible material from a supply source upwardly into each mold successively during rotation of said turret relative to said feeding means;

control means regulating the reciprocation of each piston in its cavity in timed relation to the rotation of said turret, whereby said piston moves upwardly for filling the mold with said edible material when the bottom opening of the mold is in communication with said feeding means in one rotary position of said turret and whereby said piston moves downwardly for discharging a formed patty from the cavity in another rotary position of said turret which is remote from said one rotary position; and

means for separating a formed patty from the bottom surface of said piston;

the improvement which comprises:

vertically movable support means for supporting said feeding means below said turret;

said feeding means including a feed spout assembly having a seal plate, a feed opening in said seal plate, and inlet means communicating with said feed opening for supplying said edible material under pressure; and

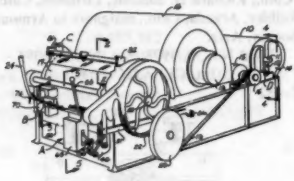
retractable fluid pressure applying means coacting with said support means for urging said seal plate upwardly in sealing engagement against the bottom surface of said turret.

4,193,168

STOP MOTION AND CONDITION RESPONSIVE APPARATUS FOR CARDING MACHINES

James H. Burnett, 5300 Augusta Rd, Apt. 160, Greenville, S.C. 29605

Filed Dec. 7, 1977, Ser. No. 858,105
Int. Cl.[2] D01G *31/00*
U.S. Cl. 19—0.25 **19 Claims**



1. Stop motion apparatus for disengaging a drive motion on a carding machine, said carding machine being of the type having motorized drive means for imparting said drive motion to said carding machine when engaged, actuator means for selectively engaging or disengaging said drive motion, said apparatus comprising:

base means for attachment to said carding machine;

a movable arm assembly carried adjacent said base means;

linkage means for connecting said arm assembly to said actuator means of said carding machine;

said movable arm assembly having a first position in which said actuator means disengages said drive motion and a second position in which said actuator means engages said drive motion;

a cam-lock assembly for locking said pivotable arm assembly in said second position;

said cam-lock assembly including a movable cam surface carried by said base means and a roller surface carried by said movable arm assembly for engaging with said cam surface in a locking relationship when said movable arm assembly is in said second position; and

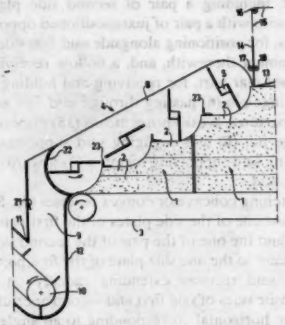
release means for releasing said cam-lock assembly allowing said movable arm assembly to move to said first position.

4,193,169

METHOD OF STRIPPING PULP BALES AND A MACHINE THEREFOR

Carl F. S. Olsson, Kampastigen 4, Vaxjo, Sweden (S-352 52)

Continuation of Ser. No. 624,581, Oct. 22, 1975, abandoned.
This application May 5, 1978, Ser. No. 903,302
Claims priority, application Sweden, Oct. 23, 1974, 7413329
Int. Cl.[2] D01G *7/02*
U.S. Cl. 19—80 R **22 Claims**



1. A method of stripping pulp bales, comprising the steps of:

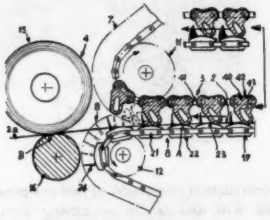
relatively moving a first group of tools and a surface of a bale against each other to strip pulp from the bale by forming a plurality of parallel grooves on said surface which are defined by opposing sidewalls, relatively moving a second, different group of tools and said surface of the bale against each other to strip pulp from the bale by contacting the opposing sidewalls of said parallel grooves.

4,193,170

DRAWING DEVICE FOR SLIVER

Jean F. Herubel, Guebwiller, France, assignor to N. Schlumberger & Cie, Guebwiller, France

Division of Ser. No. 734,969, Oct. 22, 1976, Pat. No. 4,107,821.
This application Mar. 6, 1978, Ser. No. 883,793
Claims priority, application France, Oct. 28, 1975, 75 32864; Jul. 15, 1976, 76 21611
Int. Cl.[2] D01G *19/10*
U.S. Cl. 19—127 **4 Claims**



1. A device for drawing sliver comprising two endless elements moving in unison and one located above the other and forming therebetween a working zone through which the sliver passes for the control and retention of the sliver, one of said two endless elements comprising an assembly, said assembly comprising a pair of laterally spaced endless chains mounted for movement on a closed circuit with a portion of the circuit traversing the working zone, a plurality of first transverse bars extending between said pair of endless chains and being hinged relative to one another by said endless chains, each of said first transverse bars having a first relatively flat convex active surface facing inwardly toward the other said

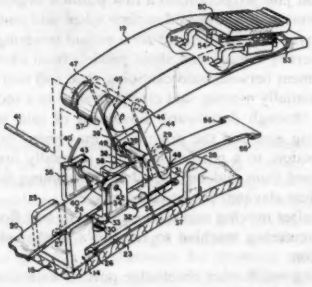
endless element as said first transverse bars traverse the working zone, said first transverse bars being spaced closely apart so that the first convex active surfaces of said transverse bars form a materially continuous apron in the working zone, the first convex active surfaces of said first transverse bars each having a crown portion located closest to the other said endless element as said first transverse bars traverse said working zone with the crown portion forming a contact surface for the sliver, a plurality of penetration members formed on and projecting outwardly from said first convex active surface toward the other said endless element as said first transverse bars traverse the working zone, said penetration members being offset in the direction of movement of said endless elements through the working zone from the crown portion of said first convex active surface on which they are located, said penetration members arranged in a row extending transversely across said first convex active surface and the other of said two endless elements comprises a succession of second transverse bars hinged to one another and each having a second convex active surface facing toward the one of said two endless elements in said working zone, two successive said second active surfaces in said working zone defining therebetween a space for receiving the row of said penetration members on said first convex surface located opposite the space and said second active surfaces cooperating with the crown portions on said first active surfaces for controlling the sliver, each said second transverse bar comprises an elongated transverse strip which in said working zone faces toward and is spaced from an oppositely disposed one of said first transverse bars, and a flexible lip secured to and extending from each said transverse strip toward the oppositely disposed one of said first transverse bars and the surface of said flexible lip spaced from said transverse strip forms said second convex active surface thereon and said second convex active surface applies the sliver to the first convex active surface of said first transverse bars.

4,193,171

SKI BOOT TIGHTENING BUCKLE

Abraham Lichowsky, 220 S. Cliffwood, Los Angeles, Calif. 90049

Filed Sep. 18, 1978, Ser. No. 942,990
Int. Cl.[2] A44B *21/00*; A43C *11/00*
U.S. Cl. 24—68 SK **4 Claims**



1. A ski boot tightening buckle including, in combination:

(a) anchor means secured on one side portion of said ski boot; and

(b) buckle means coupled to the opposite side portion of said ski boot for manual attachment to said anchor means so that tightening of said buckle means after attachment draws said one side and opposite side towards each other to tighten said boot, said buckle means including:

(1) a slide plate having a front end portion for hooking to said anchor means and defining a sliding surface extending rearwardly from said front end portion;

(2) a carriage positioned on said slide plate for sliding movement in forward and rearward directions;

(3) a drive pawl pivoted to said carriage;

(4) a clutch pawl pivoted to said slide plate in a position forward of said driving pawl;

(5) a buckle lever pivoted to a portion of said slide plate adjacent to said front end portion;

(6) drive link means pivotally connected at opposite ends to said buckle lever and carriage respectively such that swinging movement of said lever about its pivot between open and closed positions slides said carriage forwardly and rearwardly through said drive link means; and

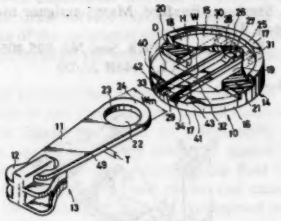
(7) a flexible strip coupled at one end to said opposite side portion of said ski boot and passing under said clutch pawl and through said carriage under said drive pawl, said clutch pawl and drive pawl resting in engagement with the top surface of said strip at an angle to the vertical whereby forward and rearward movement of said carriage drives said strip during each rearward movement in a direction to draw said opposite said portion of said ski boot closer to said one side portion to thereby tighten said ski boot.

4,193,172

ORNAMENTAL ATTACHMENT FOR SLIDE FASTENER SLIDERS

Yoshihiro Kanzaka, Nyuzen, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed May 5, 1978, Ser. No. 903,175
Claims priority, application Japan, May 12, 1977, 52-60449; May 12, 1977, 52-60450
Int. Cl.[2] A44B *19/00*
U.S. Cl. 24—205.15 H **10 Claims**



1. An ornamental attachment for a slide fastener slider with a pull tab, comprising:

(a) a body having a pair of spaced plates defining therebetween a channel for receiving the pull tab;

(b) means in said channel for locking the pull tab in the channel; and

(c) means on at least one of said plates for positionally stabilizing the pull tab in said channel, said stabilizing means including at least one land projecting from one of said plates into said channel to resiliently engage the pull tab therein.

4,193,173

CLAMP ASSEMBLY

Edwin W. Lorenz, 757 Murray Crescent, Cobourg, Ontario, Canada

Filed Oct. 17, 1977, Ser. No. 842,879
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—249 LS **5 Claims**

1. Apparatus for clamping together a pair of flanges of a processing vessel comprising: an elongated tubular stem, a handle at one end of said stem for applying torque thereto, means defining a surface at the other end of the stem for engaging one of the pair of flanges in the clamping position of said

apparatus, means defining screw threads on a portion of the interior of the tubular stem adjacent said other end thereof, an elongated threaded stud at least partially disposed within said tubular stem with the threads thereof engaging with the screw threads of the tubular stem, the stud being freely rotatable relative to said stem so that on relative rotation between them the stud is screwed inwardly or outwardly of the stem, the end of said stud remote from said stem having pivot axis defining

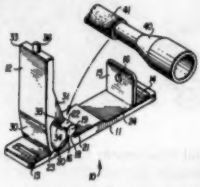
means thereon defining a pivot axis at right angles to the longitudinal axis of said threaded stud for pivotally connecting said stud to the other one of the flanges of the processing vessel, and the end of the said stud located within said tubular stem having means thereon adapted to come into interference with the threaded portion of the stem when an attempt is made to substantially completely unscrew the stud from the stem thus preventing the disengagement of the stud from the stem.

4,193,174

LEVER AND FULCRUM CLAMPING ASSEMBLY

Thomas P. Stephens, Boxford, Mass., assignor to Portex, Inc., Wilmington, Mass.

Filed Apr. 11, 1978, Ser. No. 895,405
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—249 R **12 Claims**



1. A clamping assembly for fixedly enclosing at least one generally tubular member, comprising:

first and second clamping arms each having a first end portion;

said first end portions being attached to each other to allow for the relative pivotal motion of said clamping arms;

a flange assembly including a neck portion attached to said first clamping arm and a head portion integrally attached to said neck portion, wherein said head portion is formed with a relatively greater cross-sectional size than said neck portion;

a generally wedge-shaped assembly extending from said second clamping arm; and

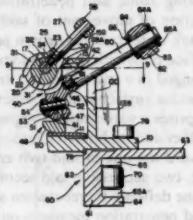
convexly-shaped surface means formed on a portion of said flange head and engagable with complementary concavely-shaped surface means formed on a portion of said wedge-shaped assembly as said second clamping arm is pivoted toward said first clamping arm, to frictionally retain at least one tubular member positioned between said clamping arms.

4,193,175

METHOD OF OPERATING A TENTERING CLIP

Hans H. Richter, Warwick, R.I., assignor to Marshall and Williams Company, Providence, R.I.

Division of Ser. No. 853,277, Nov. 21, 1977, Pat. No. 4,155,148.
This application Jun. 9, 1978, Ser. No. 914,129
Int. Cl.[2] D06C *3/04*
U.S. Cl. 26—94 **4 Claims**



1. A method of operating a tentering clip having a jaw lifting housing arm and a jaw projection to alternately grip an edge portion of a sheet of material and thereby hold said sheet in position for movement through a tentering machine and to release said sheet after movement thereof through said tentering machine comprising the steps of:

a. providing said tentering clip with a clamp surface operable to have an edge portion of said sheet engaged thereon, and a clamping shoe under control of a jaw lifting housing arm and a jaw projection operable to engage with said sheet edge portion to clamp said edge portion on said clamping surface when the tentering clip is in a first zone;

b. moving said tentering clip along said tentering machine from said first zone to a second zone to guide said sheet therealong;

c. elevating said clamping shoe, through upward movement of said jaw projection, to a first position disposed generally vertically above said surface when said tentering clip is moved into said second zone to said tentering machine to thereby release said sheet portion from clamping engagement between said clamping shoe and said surface;

d. sequentially moving said clamping shoe to a second position, through downward movement of said jaw lifting housing arm and the downward movement of said jaw projection, to a position disposed generally horizontally outward from said surface while maintaining said clamping shoe elevated above said surface;

e. thereafter moving said tentering clip to said first zone of said tentering machine to receive a further sheet edge portion;

f. aligning said further sheet edge portion with said surface;

g. moving said clamping shoe from said second position to an intermediate position through upward movement of said jaw projection placing said shoe generally vertically above said surface;

h. and thereafter releasing said clamping shoe for movement in a generally vertical path toward said surface through upward movement of jaw lifting housing arm and the downward movement of said jaw projection to clamp said further edge portion between said clamping shoe and said surface to thereby hold said sheet in position as said sheet with said further edge moves from said first zone to said second zone of said tentering machine.

4,193,176

MULTIPLE GRID FABRICATION METHOD

Matthew Patterson, Torrance, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 30, 1978, Ser. No. 956,010
Int. Cl.[2] H01J 9/14
U.S. Cl. 29—25.14 3 Claims

1. An improved method of fabricating grid electrodes, comprising the steps of:

metallurgically bonding a plurality of grid blanks separated by spacer discs onto a support member to form a sandwich structure;

forming a dimple in said sandwich structure;

machining a predetermined grid pattern through said sandwich structure in a single step; and

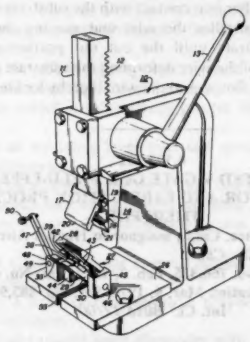
removing said spacer discs so as to leave a plurality of spaced apart, uniformly patterned, dimpled grids.

4,193,177

ELECTRICAL CONNECTOR ASSEMBLY APPARATUS

John D. Fitzgerald, Columbus, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 17, 1978, Ser. No. 961,712
Int. Cl.[2] H01R 43/04
U.S. Cl. 29—56.6 5 Claims



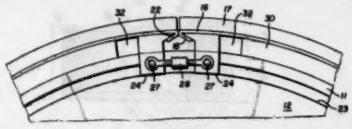
1. Apparatus for assembling an electrical connector housing (15) having an array of insulation piercing contact terminals and a conductor mounting comb (41) having a corresponding array of insulated electrical conductors (52) arranged therein, said apparatus including a press means (10) having a ram (11) and platform (26) for mounting a first and a second clamping mechanism (14, 27) therebetween for retaining said housing (15) and said comb (41), respectively, in alignment and for fitting said housing (15) about said comb (41), characterized in that said first clamping mechanism (14) is provided with a pair of jaws (16, 17) with means for clasping said housing (15), one of said jaws (16) being terminated in a conductor folding ramp (22) and a first conductor severing blade (21), said second clamping mechanism (27) is provided with a second pair of jaws (28, 29) and a pedestal (38) therebetween for supporting said comb (41), and in that one of said second pair of jaws (28) has a plurality of slots (54) corresponding to said array of conductors (52) for arranging the ends of said conductors (52) therein and is provided with a second conductor severing blade (33), and further in that said first and second blades (21, 33) cooperate to sever said conductors (52) and said ramp (22) is positioned to fold said conductors (52) about said comb (41) as said housing (15) is fitted about said comb (41).

4,193,178

COATING ROLLER

Alexander D. McArthur, Oakville; Robert J. Holsgrove, Georgetown, and Gerard Hodge, Brampton, all of Canada, assignors to Persista, Inc., Brampton, Canada

Filed May 18, 1978, Ser. No. 907,123
Int. Cl.[2] B21B 31/08; B60B 7/02
U.S. Cl. 29—129.5 8 Claims



1. In a roller formed of a cylindrical drum around which is wrapped a removable cover, the improvement comprising;

a pair of closely spaced apart, narrow, elongated strips arranged upon the outer circumferential surface of the drum and extending substantially parallel to the drum axis;

means securing said strips to the drum, with at least one of the strips being movable sideways, i.e., circumferentially of the drum, upon the drum surface;

means for releaseably interconnecting each of the opposite ends of the cover to its adjacent strip, so that movement of said one strip towards the other exerts a tangential pull upon the cover to cause the cover to tightly envelop the drum;

and a relatively thick layer of a substantially non-compressible, resilient elastomeric material secured to the larger area of the drum surface exposed between the strips, that is, the area of the peripheral surface of the drum excluding the area covered by the strips and the close space between them;

said layer of elastomeric material being between said drum and said cover and the tangential pull on the cover against said layer causes the cover to substantially uniformly surround and press radially inwardly against the layer, said layer acting like a non-compressible fluid for equalizing any forces applied to said cover, and causing movement of the elastomeric layer to correspond to the inner surface of the cover for thereby self-centering the cover.

4,193,179

PROCESS OF MANUFACTURING AN ARTICLE HAVING A GROOVE ROLLED THEREIN, AND AN ARTICLE PRODUCED THEREBY

Howard F. Confer, Bloomfield Hills, and Daniel C. Confer, Royal Oak, both of Mich., assignors to Condor Manufacturing Inc., Warren, Mich.

Filed Nov. 14, 1977, Ser. No. 851,395
Int. Cl.[2] B23P 15/10; B21H 7/18
U.S. Cl. 29—156.5 R 8 Claims

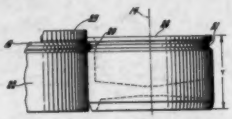
1. A process of manufacturing an article, comprising the steps of:

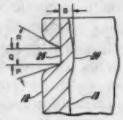
making a cup-shaped article blank which includes at least one substantially curvilinear wall member having a first substantially curvilinear surface and a second substantially curvilinear surface disposed substantially opposite to said first substantially curvilinear surface, such that said article blank is substantially in the shape of a piston for a disc brake;

rolling a piston boot groove in a first predetermined area of said first substantially curvilinear surface of said substantially curvilinear wall member while permitting a second predetermined area of said second substantially curvilinear surface to deform to predetermined dimensions during

said rolling step, said second predetermined area of said second substantially curvilinear surface being disposed substantially opposite to said first predetermined area of said first substantially curvilinear surface;

controlling the dimensions of said article blank during the aforesaid rolling step so that the thickness of said substantially curvilinear wall member between the base of said piston boot groove and said second substantially curvilinear surface is less than the thickness of said substantially curvilinear wall member between said first and second substantially curvilinear surfaces at areas remote from said piston boot groove;





making said article blank wherein said first and second substantially curvilinear surfaces are disposed concentric to a central axis, and wherein said article blank is provided with a transverse portion which is disposed substantially transverse to said central axis and said first and second substantially curvilinear surfaces, said transverse portion having its thinnest dimension adjacent to said central axis and having its thickest dimension contiguous with said substantially curvilinear wall member; and

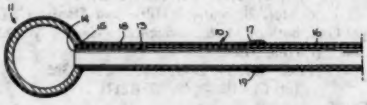
after said rolling step, facing off the end surface closest to said groove so that said faced off surface is substantially perpendicular to said central axis.

4,193,180

METHOD OF FORMING A HEAT EXCHANGER

Irving D. Press, West Orange, N.J., assignor to Resistoflex Corporation, Roseland, N.J.

Filed Mar. 2, 1977, Ser. No. 773,750
Int. Cl.² B05D *3/02*; B23P *15/26*
U.S. Cl. 29—157.4 **9 Claims**



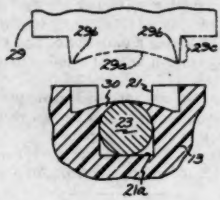
1. A method for fabricating a heat exchanger for use in a corrosive environment having metal heat exchanger tubes connected between metal manifolds and coated with a protective layer of a given fluorocarbon resin comprising in combination the steps of cross feed extruding jackets of said resin onto said tubes, removing the ends of said jackets to expose the ends of said tubes for a predetermined distance, assembling said ends of said tubes into corresponding openings in said manifolds, producing heat fused metal joints between said tubes and said manifolds while maintaining the temperature of said jackets below the melting point of said resin, coating said manifolds, the exposed portions of said tubes and the ends of said jackets with said given fluorocarbon resin by spraying in dry powder form, and thereafter applying heat to fuse said sprayed on resin to provide a continuous monolithic coating of resin over said tubes and manifolds.

4,193,181

METHOD FOR MOUNTING ELECTRICALLY CONDUCTIVE WIRES TO A SUBSTRATE

Henry J. Boulanger, Cumberland, R.I., and Salvatore P. Rizzo, Foxboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 747,654, Dec. 6, 1976, Pat. No. 4,123,627.
This application Feb. 21, 1978, Ser. No. 879,180
Int. Cl.² B25K *25/00*; H01H *9/00*
U.S. Cl. 29—509 **3 Claims**



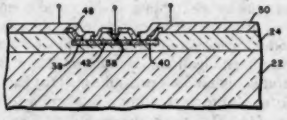
1. A method for locking a round wire in a groove in a substrate in which the wire is disposed entirely below the surface of the substrate comprising the steps of employing a deformable substrate, providing a member having a generally concave cut out portion between two projecting ears, the cut out portion having a diameter greater than the diameter of the wire, bringing the member into contact with the substrate so that the cut out portion straddles the wire and moving the member toward the substrate until the cut out portion essentially contacts the top of the wire deforming the substrate so that the substrate material flows onto the wire thereby locking the wire in the groove.

4,193,182

PASSIVATED V-GATE GaAs FIELD-EFFECT TRANSISTOR AND FABRICATION PROCESS THEREFOR

Don H. Lee, Agoura, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 766,325, Feb. 7, 1977, Pat. No. 4,156,879.
This application Mar. 6, 1978, Ser. No. 883,978
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **4 Claims**



1. A process for fabricating a field-effect transistor which includes the steps of:

(a) implanting selected conductivity-type determining ions through one surface of a semiconductor body to form a buried layer therein,

(b) masking said surface to define source, drain and channel regions within the previously formed buried layer,

(c) implanting additional ions into selected regions of said buried layer to define heavily doped source and drain regions interconnected by a lightly doped channel region,

(d) removing portions of said semiconductor body overlying said source and drain regions to thereby expose same for electrical contacts, while leaving intact a semiconductor

mesa configuration covering and passivating said channel region,

(e) forming a passivation layer atop said source, drain and mesa regions and having openings therein aligned with electrical contact areas for said source, drain and channel regions,

(f) removing a predetermined portion of said semiconductor mesa to expose a small predetermined area of said channel region for electrical contact, and

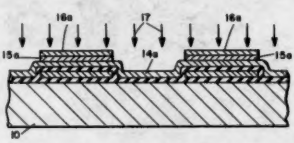
(g) depositing ohmic contact metallization on said source and drain regions, and further depositing Schottky-gate metallization in the removed portion of said semiconductor mesa and on an exposed area of said channel region.

4,193,183

INFRARED PHOTOLITHOGRAPHIC PROCESS FOR CONSTRUCTING SELF-ALIGNED ELECTRODES

Thomas Klein, Saratoga, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 26, 1978, Ser. No. 919,157
Int. Cl.² B01J *17/00*
U.S. Cl. 29—578 **15 Claims**



1. A process for constructing self-aligned electrodes on an insulating layer lying on a surface of a semiconductor substrate having dopant impurity atoms of a first density comprised of the steps of:

forming on said insulating layer, spaced apart polysilicon electrodes having dopant impurity atoms of a second density which is substantially greater than said first density;

forming an insulating layer over said spaced apart polysilicon electrodes;

forming on said insulating layer over said electrodes, a layer of polysilicon having dopant impurity atoms of a third density which is substantially less than said second density;

forming a layer of image reversal material on said polysilicon layer;

forming a layer of heat sensitive polymer on said image reversal layer;

heating said spaced apart electrodes with infrared radiation to polymerize said heat sensitive polymer directly above said electrodes;

removing the unpolymerized portions of said heat sensitive polymer layer and the underlying portions of said image reversal layer to expose the portions of said polysilicon layer lying between said spaced apart electrodes;

forming an insulating layer on said exposed portions; and

removing said polysilicon layer in the regions not covered by said insulating layer on said exposed portions.

15. A process for constructing self-aligned electrodes overlying a surface of a semiconductor substrate that is substantially transparent to infrared radiation including the steps of:

forming spaced apart ones of said electrodes with conductive means that is highly absorbative of infrared radiation;

forming a continuous layer of heat sensitive polymer means over and between said spaced apart electrodes for polymerizing in response to heat applied thereto; and

exposing the resulting structure to infrared radiation to heat said spaced apart electrodes and thereby heat and polymerize said heat sensitive polymer means in the regions lying directly above said spaced apart electrodes.

4,193,184

METHOD OF MANUFACTURING A STATOR FOR AN ELECTRICAL MACHINE

Bodo Fütterer, Lucerne, Switzerland, assignor to Interelectric AG, Sachseln, Switzerland

Continuation-in-part of Ser. No. 739,264, Nov. 5, 1976, Pat. No. 4,125,791. This application Sep. 15, 1978, Ser. No. 942,765
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1975, 2550640
Int. Cl.² H02K *15/02*
U.S. Cl. 29—596 **7 Claims**

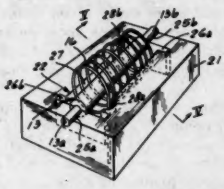
1. A method for manufacturing a stator for electrical machines, which stator comprises an outer ferromagnetic flux return means, a permanent magnet system positioned inside of said flux return means in a coaxial and equidistant relationship thereto and having at least four permanent magnets, each shaped cylindrically at its outer surface, and an end plate supporting said magnetic flux return means and said permanent magnet system, comprising the steps of securing said flux return means to said end plate, inserting said permanent magnets into the interior of a sleeve, the inner diameter of which corresponds to the desired outer diameter of the permanent magnet system, providing a plurality of ferromagnetic link members equal in number to the number of permanent magnets, each of said link members being adapted to come into planar contact with the radially inner surface of two adjacent ones of said permanent magnets, applying a bonding agent to at least one of the surfaces of said permanent magnets and of said link means, bringing each of said link means into contact with two adjacent ones of said permanent magnets until the bonding agent has cured, securing the so formed permanent magnet system to the end plate, and withdrawing said sleeve from said permanent magent system.

4,193,185

METHOD OF MAKING A HIGH TOLERANCE COIL ASSEMBLY

James P. Liautaud, River Bluff Rds., Cary, Ill. 60013

Filed Jan. 12, 1978, Ser. No. 868,995
Int. Cl.² H01F *41/06*
U.S. Cl. 29—605 **4 Claims**



1. A method of constructing a low cost high tolerance molded coil, comprising the steps of:

winding a coil with at least first and second connection leads;

providing a mold having first and second mating mold blocks, each block having a mold cavity therein for the

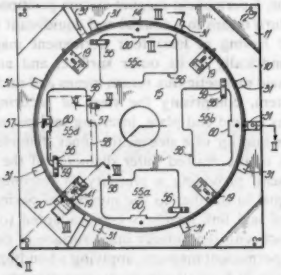
formation of an integral outer core for supporting said coil and integral connection lead and coil securing portions;
placing the coil in the mold cavity of the first block;
providing a pre-molded and pre-shrunk plastic inner core;
aligning and supporting said inner core approximately along a longitudinal center line of the coil;
mating the second mold block with the first mold block;
injecting a heated molding plastic into the mold cavities formed inside of the mated blocks; and
cooling and removing the molded coil from the mold blocks without withdrawing the inner core from the molded coil, the pre-shrunk inner core preventing shrinking of the outer core during cooling to substantially stabilize electrical variances of the coil.

4,193,186

ROTARY INDEXING APPARATUS FOR AUTOMATIC DEVICE INSERTION ON PRINTED CIRCUIT BOARDS

Rolf Boehler, Dorchester, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 1, 1978, Ser. No. 938,937
Int. Cl.[2] H05K *3/30*
U.S. Cl. 29—741 **5 Claims**



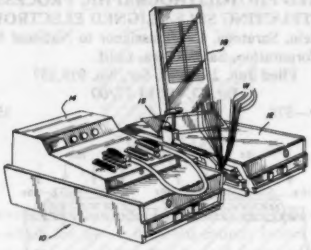
1. Rotary indexing apparatus for automatic device insertion on printed circuit boards, comprising:
a support plate for attachment to an insertion machine, said support including a central circular aperture;
a locating and support member rotatably located and supported at its periphery in said circular aperture, said periphery of the locating and support member having two circumferential surfaces inclined at 90° to each other to provide an upper surface and a lower surface, said surfaces inclined at 45° to the plane of the locating and support member, a plurality of first rollers extending from said support plate and engaging with said lower surface, said first rollers each rotatably mounted for rotation about an axis parallel to said lower surface, and a plurality of second rollers extending from said support plate and engaging with said upper surface, said second rollers each rotatably mounted for rotation about an axis parallel to said upper surface, said pluralities of rollers rotatably locating, supporting and retaining said locating and support member in said circular aperture;
a plurality of locations on said locating and support member, each location comprising an aperture and locating and support means associated with the aperture to hold a printed circuit board, said locations spaced around a central axis to provide predetermined angular orientations of said printed circuit boards;
a plurality of manually operated latches on said locating and support member, a latch for each location, each latch adjacent to the related location, and a stop on the support plate, for rotationally locating said locations about said central axis for sequential positioning of said locations beneath an insertion position on said insertion machine, each of said latches comprising a radially slidable member having an outer end for engagement with said stop, and means resiliently urging said radially slidable member outwards, said stop including a member mounted on said support plate and including a recess for reception of said outer end of said radially slidable member for positive location of said locating and support member.

4,193,187

CLAMP-SQUEEZING APPARATUS

Jacob S. Haller, Northbrook; Gordon L. Mines, Elmhurst, and Meinert J. Mischnick, Mount Prospect, all of Ill., assignors to TRW, Inc., Elk Groove Village, Ill.

Filed Mar. 27, 1978, Ser. No. 890,671
Int. Cl.[2] B23P *19/00, 11/00*
U.S. Cl. 29—749 **13 Claims**



1. A clamp squeezing apparatus comprising a stationary support, a support plate mounted on said stationary support for reciprocal movement along a path of travel; a nest mounted on said support plate for positioning an electrical connector having a cable clamp disposed thereon; squeeze arms pivotally mounted on said movable plate; squeeze jaws connected to said squeeze arms located so as to be disposed on either side of a connector clamp when such connecter is mounted on said nest; means carried by said plate for moving said plate along an axial path, and stationary cam means on said stationary support and connected to said squeeze arms for urging said squeeze arm jaws into clamping engagement with a connector cable clamp mounted on said nest in the course of support plate movement.

4,193,188

FLEXIBLE SAW

Robert M. Johnson, 11 Jana Dr., Weston, Conn. 06883

Filed Sep. 29, 1978, Ser. No. 947,017
Int. Cl.[2] B23D *45/00*
U.S. Cl. 30—166 R **1 Claim**

1. A flexible saw for sawing high branches from trees comprising a flexible cutting area, and flexible holding means on each end of the flexible cutting area to oscillate the cutting area against a branch of a tree to be cut, and wherein said cutting area comprises a base and a series of spaced apart cutting means secured thereto, and wherein said base is a cable and the cutting means are collars frictionally secured thereon and having sharp points solely on one end thereof, and wherein said cutting area cable has loops formed thereon at each end, and generally similar loops formed on one end of each of the holding means whereby said cutting area and said holding means are permanently secured together, and a weight detachably attached to an opposite end of only one holding means, and wherein said cable is metal, and said collars are metal and are positioned on said cable with sharp points on one end of each collar and a smooth surface on the opposite end of each collar, the sharp points of every other collar facing toward one end of the cable and the sharp points of collars in between every other collar facing toward the opposite end of the cable such that the ends of collars having the sharp points face each other and the ends of collars having the smooth surface face

each other, and wherein the holding means is made of plastic and is longer than the cutting area cable, and wherein said sharp points form teeth, and the outside diameter of the collars are in the range of 0.110–0.132", the inside diameter between 0.058–0.078", the length from ⅛–⅜", and the teeth formed at a

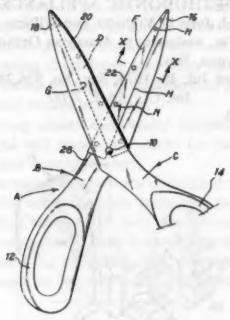
60° angle to each other thereby forming 4 teeth on the cutting end of each collar, and wherein the length of the cable is in the range of 30–70", and 35–100 cutting collars are equally spaced ¼–½" apart starting from the mid-point of the length of the cable and extending towards its outer ends.

4,193,189

SCISSORS OR SIMILAR CUTTING TOOLS WITH PLASTIC HANDLES

Sergio Marin, Via Trento, Inverigo (Como), Italy

Filed Jul. 17, 1978, Ser. No. 925,623
Claims priority, application Italy, Sep. 27, 1977, 22375/77[U]
Int. Cl.² B26B *13/04*
U.S. Cl. 30—260 **5 Claims**



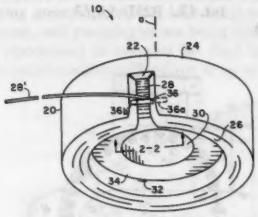
1. A scissors comprising first and second pivotably connected arms, each arm including a finger-engaging portion and a remote tip portion, each said arm being constituted in entirety of a plastic material, each arm having a recessed seat, a metal blade for each arm, and means for removably securing the blade in a respective seat in each arm, said means comprising integral projections on each arm extending in each seat from the bottom surface thereof, said projections being of truncate conical shape, each blade being provided with a hole for receiving a respective projection, said hole being shaped to engage a respective projection and enable removal of the blades by the elasticity of the plastic material of the projection.

4,193,190

FILAMENT TRIMMER CUTTING HEAD IMPROVEMENT

Dale A. Wood, 1011 Wiseburg Rd., Whitehall, Md. 21161

Filed Jun. 15, 1978, Ser. No. 915,727
Int. Cl.² A01D *55/18*; A01G *3/06*
U.S. Cl. 30—276 **10 Claims**



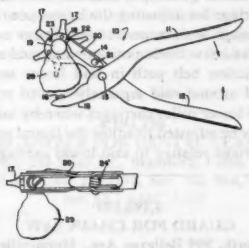
1. In a filament trimmer cutting head of the type having inverted-cup-shape with structure defining a generally parallel-sided slot extending from proximate the base of the cup shape through the rim of the inverted cup shape for guiding filament cutting length, and having provision for manually feeding filament by drawing filament free of the slot, unwinding and replacing the filament in the slot, the improvement comprising: a pin, said pin having affixation across the slot at a location intermediate the length of the slot, providing room for said filament to be retained by the pin between the pin and the base of the inverted cup shape, thereby preventing said filament from moving downwardly out of the slot during cutting operations.

4,193,191

TURRET PUNCH

John J. Sisco, 11354 Evans Trail, Beltsville, Md. 20705

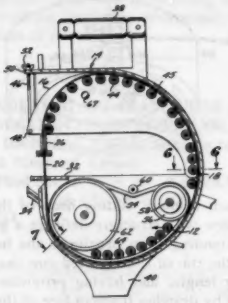
Filed Jul. 3, 1978, Ser. No. 921,804
Int. Cl.² B26F *1/00*
U.S. Cl. 30—364 **5 Claims**



1. In a turret type punch having a pair of pivoted handles with jaws mounted at one end of said handles and wherein there is provided a rotatable turret on one of said jaws, said turret having a plurality of open ended cutting tubes mounted thereon and wherein an anvil is provided on the other of said jaws against which one end of the cutting tubes will contact upon forcing the handles to a position wherein said one end of said cutting tubes will be forced against said anvil to form an opening in a material placed between said tube and said anvil, the improvement comprising, an opening formed centrally of said jaw having said rotatable turret with said tubes mounted thereon, the interior of said tubes communicating with said opening, a sleeve mounted within said opening, said sleeve having an opening therein aligned with one of the said tubes, a channel formed on one end of said sleeve, a receptacle detachably secured to said channel, the cut portion of the said mate-

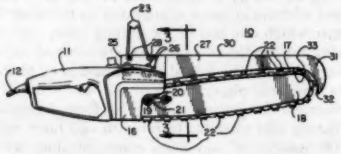
rial passing through said tubes and entering into said sleeve and ultimately into said receptacle.

4,193,192
BAND SAW
Jose L. Cortez, 9050 E. Jeff St., Bellflower, Calif. 90706
Filed May 8, 1978, Ser. No. 903,901
Int. Cl.[2] B23D *53/12*
U.S. Cl. 30—380 **4 Claims**



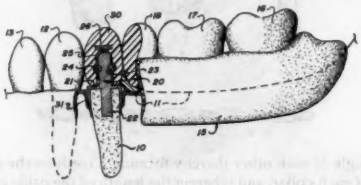
1. A band saw comprising:
a main frame having an upper and lower section;
a pair of upper and lower roller carriages having a plurality of spaced and arcuately arranged rollers, said upper roller carriage being mounted from said main frame and adjustably connected to said upper section of said frame for lateral shifting with respect thereto;
friction belt drive means mounted in said low section of said frame having a drive pinion, a friction pulley and a plurality of spaced and arcuately arranged friction rollers and a friction belt, said drive pulley, said friction pulley and said friction rollers defining an arcuately shaped friction belt path;
adjustment means connected between said main frame and upper carriage for adjusting the lateral positioning of said upper carriage with respect to said lower carriage; and,
an endless band saw blade positioned around said arcuately shaped friction belt path in said lower section of said frame and around said arcuately spaced rollers on said upper and lower roller carriages whereby said adjustment means may be adjusted to adjust the lateral position of said upper carriage relative to said lower carriage.

4,193,193
GUARD FOR CHAIN SAW
Adolph Holzworth, 909 Bellevue Ave., Hulmeville, Pa. 19047
Filed Aug. 9, 1978, Ser. No. 932,354
Int. Cl.[2] B27B *17/02*
U.S. Cl. 30—382 **3 Claims**



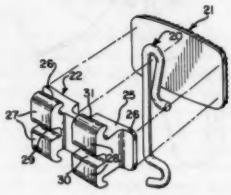
1. In combination with a chain saw having a housing containing a motor, a grip frame engaged with the motor housing, an exposed saw chain carried on an exposed chain bar detachably secured to the housing,
a guard which comprises
an elongated rigid bar of flat material fixedly attached to said motor housing and extending in spaced relation above said saw chain a distance greater than the length of said chain bar,
said bar being of a width less than the width of the saw chain.

4,193,194
DENTURE
David D. Dalise, Suite A, 7111 Prospect Pl. NE., Albuquerque, N. Mex. 87110
Filed Jun. 19, 1978, Ser. No. 916,891
Int. Cl.[2] A61C *13/22*
U.S. Cl. 433—177 **8 Claims**



1. A removable denture attachment system for use with a natural or implanted fixed root system which comprises in combination:
(a) a post supported by said root system,
(b) a resilient ring on said post,
(c) an encapsulating envelope surrounding said ring and post, and
(d) a denture surrounding said post, ring, and envelope.

4,193,195
ORTHODONTIC APPLIANCE
Daniel A. Merkel; John E. Viglietti, and William P. Gagin, all of Sheboygan, Wis., assignors to American Orthodontics Corporation, Sheboygan, Wis.
Filed Jul. 20, 1978, Ser. No. 926,287
Int. Cl.[2] A61C *7/00*
U.S. Cl. 433—13 **9 Claims**



1. An orthodontic appliance in combination with a bracket mountable on a band or pad, said bracket including an occlusogingivally extending slot at the face engaging the band or pad, said appliance including a base received in said slot and locked against movement when said bracket is attached to the band or pad, and an arm extending from the base with a hook on the free end thereof for receiving an elastic force transmission member, whereby the appliance is removable from the assembled bracket and band or pad by severing a portion of the appliance base.

4,193,196

FLUID SUPPLY UNIT FOR DENTAL INSTRUMENTS

Arthur Kuris, Riverdale, and Leonard W. Suroff, Jerico, both of N.Y., assignors to Aquasonic Products Corp., New York, N.Y.

Continuation-in-part of Ser. No. 843,416, Oct. 19, 1977, and Ser. No. 702,536, Jul. 6, 1976, abandoned. This application May 15, 1978, Ser. No. 905,866

Int. Cl.[2] A61C *19/02*

U.S. Cl. 433—82 **46 Claims**

1. An auxiliary fluid supply unit for use in conjunction with a dental or medical instrument having a handpiece including an operative tip adapted for simultaneous activation and supplying of fluid through the handpiece as well as the tip, said fluid supply unit comprising:

A. dispensing means for pumping fluid and adapted to be coupled to said instrument so that fluid is communicated to the handpiece,

B. fluid reservoir means communicating with said dispensing means to permit the utilization of a variety of fluids for performing procedures with the instrument,

C. said dispensing means includes pumping means communicating with said reservoir means for pumping fluid under pressure to said instrument,

D. remote control means electrically coupling said instrument to said dispensing means for simultaneously energizing the instrument and the auxiliary fluid pumping means and dispensing fluid from said reservoir means by said pumping means through the handpiece, and

E. said control means including:

(1) switching means electrically coupled to said instrument and said dispensing means for simultaneous energizing and control thereof,

(2) remote means operatively connected to said switching means for simultaneously activating the instrument and permitting the flow of fluid therethrough, and

(3) connecting means between said control means and said instrument for permitting the remote operation of the instrument by activation of said control means.

4,193,197

FLUID SUPPLY UNIT AND SYSTEMS FOR DENTAL AND MEDICAL INSTRUMENTS

Arthur Kuris, Riverdale, and Leonard W. Suroff, Jericho, both of N.Y., assignors to Aquasonic Products Corp., New York, N.Y.

Continuation-in-part of Ser. No. 702,536, Jul. 6, 1976, abandoned. This application Oct. 19, 1977, Ser. No. 843,416

Int. Cl.[2] A61C *13/00*

U.S. Cl. 433—82 **31 Claims**

1. An enclosed supply unit for use in conjunction with a dental or medical instrument having a handpiece including a tip adapted to be associated within the oral cavity or the like and requiring fluid to be supplied through the handpiece to the tip, said fluid supply unit comprising:

A. dispensing means for pumping fluid and adapted to be coupled to the instrument so that fluid is supplied to the handpiece,

B. fluid reservoir means communicating with said dispensing means to permit the utilization of fluids while performing oral hygienic procedures with the instrument,

C. pumping means operatively associated with said dispensing means, said pumping means being maintained continuously operational to maintain the fluid in said dispensing means under continuous pressure so as to obtain an immediate flow of fluid to the handpiece upon the instrument being operational,

D. said fluid reservoir means is in the form of a container that is adapted to be readily engaged with said dispensing means and contains a fluid therein for dispensing to the instrument,

E. mounting means for coupling said container in releasably fixed relationship to said dispensing means, and

F. venting means operatively associated with said mounting means for venting said container so as to permit a flow of air into said container to replace the fluid displaced therefrom.

4,193,198

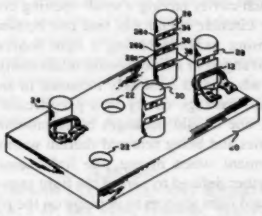
ORGANIZER FOR DENTAL CLAMPS

Philip J. Bauer, 214 Slice Dr., Stamford, Conn. 06907

Filed Nov. 27, 1978, Ser. No. 963,773

Int. Cl.[2] A61C *3/00*

U.S. Cl. 433—77 **8 Claims**



1. For use in supporting and systematically organizing according to shape and size a plurality of metal dental clamps of the type having a bow and a pair of legs a portable rack comprising:

a support member, and

at least one elongated post projecting from said support member,

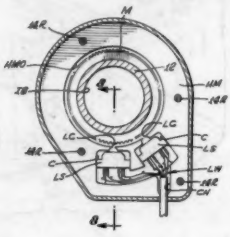
each said at least one post having at least one slit formed in its outer wall extending inwardly and substantially perpendicular to its longitudinal axis dimensioned to receive therein and support the bow portion of a dental clamp, and having contained therein permanent magnet material exposed at least at the inner end of said slit for retaining the dental clamp in the slit by magnetic attraction.

4,193,199

SHAFT POSITION TRANSDUCER

Glenn R. Whiteley, Pasadena, and Michael F. Bent, South Pasadena, both of Calif., assignors to Servo Products Company, Pasadena, Calif.

Filed May 15, 1978, Ser. No. 906,073
Int. Cl.² G01B 3/18; G01D 5/34
U.S. Cl. 33—1 PT **12 Claims**



1. A shaft position transducer adapted to be mounted on a shaft comprising

a bushing carrying a rotary scale means in the form of a gear having a plurality of equally spaced gear teeth and with the top surface of the gear teeth having light characteristics of one kind and the areas between the teeth having light characteristics of another kind,

a housing constructed of two pieces adapted to be secured together for enclosing the bushing and the rotary scale means, one housing piece having an internally constructed circular opening for permitting the rotary scale to rotate in one housing piece and to be completely enclosed within the internal circular opening of said one housing piece, said housing pieces having a central aperture for mounting the bushing therein,

a pair of cavities for mounting a light sensing package in each of the cavities defined on the inside surface of the housing in said one housing piece at a location spaced radially outwardly of the circular opening for the rotary scale, each cavity having a small opening communicating with the circular opening of said one housing piece,

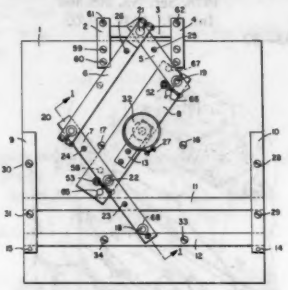
a light sensing package having a light source and a light sensor arranged in a side-by-side relationship in the package and adapted to be snugly mounted in and retained in the circuit package cavity in a preselected nonmovable position, one of said packages being mounted in each of the cavities and being retained therein without possibility of movement when in use, the light sensing packages being further defined to permit the light rays emitted from each of said light sources to impinge on the rotary scale by being conveyed thorugh the individual small opening and be reflected therefrom and being reconveyed through said small opening to impinge on the light sensor for providing electrical analog signals representative of the successive gear teeth when the top surfaces of the rotary scale means rotates past each of said small openings.

4,193,200

ENGRAVING MACHINES

Lewis E. Massie, Box 79, Solana Beach, Calif. 92024

Filed Nov. 13, 1978, Ser. No. 959,907
Int. Cl.² B43L 13/10
U.S. Cl. 33—25 B **4 Claims**



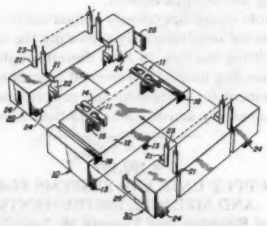
1. In an engraving machine comprising a mounting assembly and a pantograph structure comprising a pantograph frame comprising two pairs of arm members pivotally joined to each other in pantograph form and attached to said mounting assembly, the combination of a joint means for pivotally joining said arm members comprising axially aligned bores in adjoining arm members and a shaft of rigid material extending through and beyond opposite ends of the bores, said shaft secured to one of the respective arms by means of a slotted bore and clamping screw, the mating arm having a bore providing a bearing for said shaft, said mating arm comprising two parts in face to face butting contact along a plane perpindicular to the axis of the bore and shaft, said two parts being joined by screws extending through enlarged holes in one part and engaging threaded holes in the other part thus threaded holes providing means for displacing the two parts in any direction in their mutual planes, said displacement drawing the two parts in snug though moving engagement with the shaft.

4,193,201

SOLDERLESS ELECTRICAL CONNECTOR CONSTRUCTION

Robert H. Van Horn, Worthington, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 29, 1978, Ser. No. 964,452
Int. Cl.² H01R 13/38
U.S. Cl. 339—98 **8 Claims**



1. An electrical connector construction including a terminal block (10) having a row of terminal means (11) extending from a surface (12) of said terminal block (10), characterized in that each of said terminal means (11) comprises first and second oppositely directed, insulation-piercing blades (16, 17),

a first block (20) is provided having a row of cavities (22) therein on one side face to receive corresponding ones of said first blades (16) and further having conductor receiv-

ing channels (21) formed therein on said one face perpendicular to and in registration with said first blades (16), and in that

a second block (30) is provided also having a row of cavities (22) therein on one side face to receive corresponding ones of said second blades (17) and further also having conductor receiving channels (21) formed therein on said one face perpendicular to and in registration with said second blades (17), and further in that said first and second blocks (20, 30) are fitted into abutment at said side faces along said surface of said terminal block (10) for connecting conductors (23), when fitted in said channels (21), between said blades (16, 17) of said terminal means (11).

4,193,202

APPARATUS AND METHOD FOR DETERMINING THE LOCATION OF PERIPHERAL POINTS OF BODIES

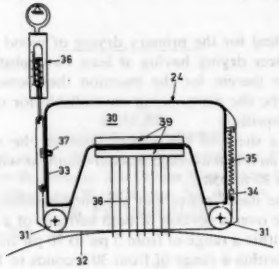
Albert Kürzi, and Willy Mersiovsky, both of Zurich, Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Sep. 22, 1978, Ser. No. 944,785

Claims priority, application Switzerland, Sep. 23, 1977, 11647/77

Int. Cl.[2] G01B *7/02*

U.S. Cl. 33—174 L **15 Claims**



1. An apparatus for determining the position of peripheral points of a body to be measured, such as a body of rotation, relative to an axis of the body, comprising:

a sensing gauge head member carried by means for moving said gauge head member toward the body to be measured;

a flexible member under mechanical stress between two portions of the sensing gauge head; and,

signal means for indicating that the flexible member is in contact with the body to be measured, the signal means being operatively connected to the flexible member.

4,193,203

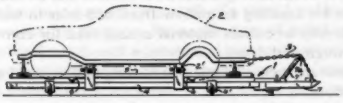
METHOD AND APPARATUS FOR REFORMING AND STRAIGHTENING VEHICLES

Pierre N. LeGrand, Ashford, England, and Dirk J. van Dalen, Janesville, Wis., assignors to Applied Power Inc., Milwaukee, Wis.

Division of Ser. No. 831,508, Sep. 8, 1977. This application Apr. 14, 1978, Ser. No. 896,186

Int. Cl.[2] B21D *1/14*; G01B *5/24*

U.S. Cl. 33—180 AT **5 Claims**



1. A measuring bridge for use in an apparatus for straightening and reforming a vehicle for indicating and monitoring the magnitude of correction in the repair of the vehicle, said measuring bridge being supported on a surface below the vehicle and comprising:

a plurality of interconnected tracks,

a plurality of independent support means movably mounted on said tracks for at least longitudinal and lateral movement,

a plurality of reference elements mounted on said independent support means and engageable with datum points on undamaged portions of the vehicle to provide predetermined reference positioning of the measuring bridge with respect to the vehicle,

a plurality of indicating elements mounted on said independent support means and in coupling relationship with datum points on damaged and unaligned portions of the vehicle, said indicating elements responding to the application of corrective forces to provide a continuous indication of the magnitude of correction of the vehicle,

and means disposed between the tracks and the supporting surface for positioning the tracks and elements mounted thereon relative the vehicle before and during repair thereof and the reference elements in engagement with the vehicle, said positioning means including roller means for permitting rolling movement between the tracks and the supporting surface.

4,193,204

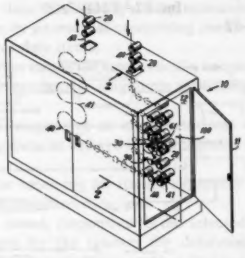
ULTRAVIOLET LIGHT CURING APPARATUS FOR CONTAINERS AND THE LIKE

Irving Nerod, Geneva, N.Y., assignor to American Can Company, Greenwich, Conn.

Filed Dec. 11, 1978, Ser. No. 968,015

Int. Cl.[2] F26B *3/30*

U.S. Cl. 34—4 **7 Claims**



1. A method for continuously curing ultra-violet-curable coated articles comprising:

(a) passing said articles about an ultraviolet light source;

(b) rotating the surfaces of the articles relative to the light source as the articles pass thereabout

(c) rotating reflector means about the light source in substantially synchronous relation to the articles, thereby focusing the light continuously on the surfaces of the articles during passage thereof about the light source.

4,193,205

COLUMNAR CONTAMINANT REMOVER

Frank M. Black, P.O. Box 9254, Houston, Tex. 77011

Filed Aug. 28, 1978, Ser. No. 937,063

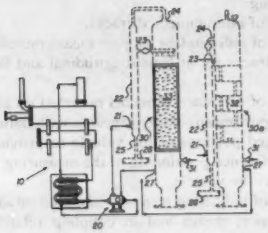
Int. Cl.[2] F26B *3/00*

U.S. Cl. 34—9 **2 Claims**

2. A method of removing contaminants from a gas comprising:

causing said gas to move upwardly within a vessel from near

its bottom along a tortuous and spiralar path to exit near said vessel's top, and



causing a cleaning liquid to move downwardly from near said vessel's top counter currently to the upward path of said gas to exit near said vessel's bottom.

4,193,206

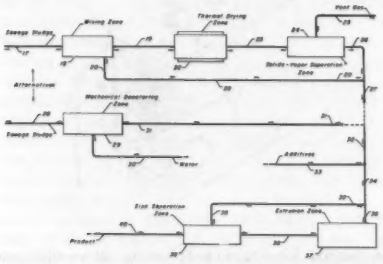
PROCESSES FOR DRYING SEWAGE SLUDGE AND FILTERING WATER

Vere Maffet, West Chester, Pa., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 775,673, Mar. 8, 1977, Pat. No. 4,128,946, Ser. No. 813,577, Jul. 7, 1977, Pat. No. 4,098,006, Ser. No. 813,578, Jul. 7, 1977, Pat. No. 4,098,006, Ser. No. 844,097, Oct. 20, 1977, Pat. No. 4,121,349, Ser. No. 858,879, Dec. 8, 1977, Pat. No. 4,161,825, and Ser. No. 891,437, Mar. 29, 1978, which is a continuation-in-part of said Ser. No. 813,577, said Ser. No. 858,879, is a continuation-in-part of said Ser. No. 813,577, and Ser. No. 813,578, said Ser. No. 844,097, is a continuation-in-part of said Ser. No. 813,578, said Ser. No. 813,578, and Ser. No. 813,577, each is a continuation-in-part of said Ser. No. 775,673. This application May 25, 1978, Ser. No. 909,587

Int. Cl.[2] F26B *7/00*

U.S. Cl. 34—12 **15 Claims**



1. A process for drying sewage sludge which comprises the steps of:

(a) passing a feed stream comprising sewage sludge into a toroidal dryer operated at drying conditions and effecting the evaporation of water contained in the feed stream, and the production of a toroidal dryer effluent stream comprising particles of sewage sludge derived from the feed stream and water vapor;

(b) separating said toroidal dryer effluent stream in a solids-vapor separating zone and producing a vapor stream comprising water vapor and a dry solids stream comprising dried sewage sludge and containing less than about 15 wt. % water;

(c) admixing a plasticizer comprising an aqueous formaldehyde solution into at least a first portion of the dry solids stream, with the amount of plasticizer which is added being less than 5 wt.% of the first portion of the dry solids stream; and,

(d) extruding the first portion of the dry solids stream in an extrusion zone under conditions sufficient to effect the formation of a product stream having a bulk density greater than about 30 lb/ft^3.

4,193,207

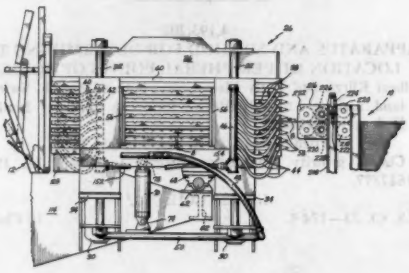
METHOD FOR VENEER DRYING

Richard C. Allen, and Darrell E. Pierson, both of Federal Way, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 20, 1978, Ser. No. 888,457

Int. Cl.[2] F26B *3/20*

U.S. Cl. 34—13.8 **6 Claims**



1. A method for the primary drying of wood veneer in a contact veneer drying having at least two substantially flat metal plates therein for the insertion therebetween of wet veneer sheets, the plates being controllable for opening and closing, comprising:

inserting a sheet of wet veneer between the metal plates having an initial average moisture content within a range of from 30 to 250%;

closing the metal plates and applying continuous uniform pressure over a portion of both surfaces of a wet veneer sheet within a range of from 5 psi to 70 psi and for a time period within a range of from 30 seconds to 12 minutes;

elevating the temperature of the contact surfaces of the metal plates to a level within a range of from 250° F. to 400° F. and continuously holding the temperature within the range for the time period during which the pressure is applied; and

simultaneously with the application of the pressure and temperature continuously exhausting the water and steam generated to atmosphere through a plurality of exhaust grooves positioned in at least one of the metal plates on a contact surface thereof.

4,193,208

SINGLE PASS ALFALFA DEHYDRATOR DRYER AND FLIGHTING THEREFOR

Richard L. Ronning, Overland Park, Kans., assignor to Ronning Engineering Company, Inc., Overland Park, Kans.

Filed Nov. 18, 1977, Ser. No. 852,690

Int. Cl.[2] F26B *11/04*

U.S. Cl. 34—131 **9 Claims**

1. A single pass dehydrator for drying moisture laden combustible material, said dehydrator including:

an elongate, generally horizontal, material-receiving hollow dryer drum having a sidewall, an inlet and an outlet;

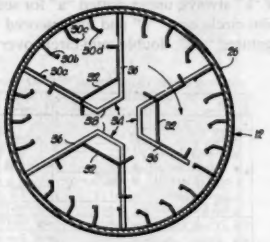
means for creating an airflow from said inlet to said outlet whereby to entrain material at said inlet for conveyance through said drum;

a burner adjacent said inlet for heating said material and said airflow;

a number of elongate flighting panels disposed within said drum in offset relation to the longitudinal axis of the latter; and

means mounting said panels on said drum in offset relation to the sidewall thereof,

said mounting means including a plurality of elongate support struts spaced along the length of said drum, each strut extending generally transversely of the drum between the



drum wall and said panels for supporting the panels against longitudinal buckling while at the same time spacing said panels from said sidewall of the drum,

said struts being arranged in pairs, each pair of struts being interconnected to form a rigid U-shaped support for a respective panel.

4,193,209

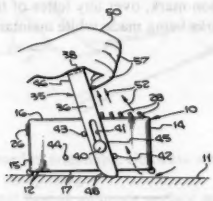
FINGERNAIL DRYER

Paula J. Lovison, 916 N. First St. #E, Alhambra, Calif. 91801, and William D. Lovison, 260 Colusa Way, Vista, Calif. 92083

Filed Sep. 28, 1978, Ser. No. 946,545

Int. Cl.[2] F26B *21/00*

U.S. Cl. 34—239 **6 Claims**



1. A cosmetic accessory device for the hands comprising a housing for use on a supporting surface, said housing having sidewall, topwall and bottomwall structures providing a chamber, a power actuated fan contained in said chamber, outlet passage means for said fan in one of said wall structures, a source of power for said fan and a switch mounted on said housing in operative relationship with said source of power, a hand supporting bracket comprising legs having opposite side edges, a hand rest extending between adjacent ends of the legs, opposite ends of the legs having each a pivotal connection to the housing on respective opposite sidewall structures, said bracket having a first position wherein said hand rest is in a hand supporting position located adjacent said outlet passage means wherein to support fingernails of a user's hand in successive positions for cleaning, for application of polish and for drying of said polish, and wherein said legs are in a position on the supporting surface, the pivotal connection of at least one of the legs comprising a releasable interlocking connection with said housing, said bracket having a second position wherein the hand rest is spaced from an adjacent sidewall structure and in a carrying position.

4,193,210

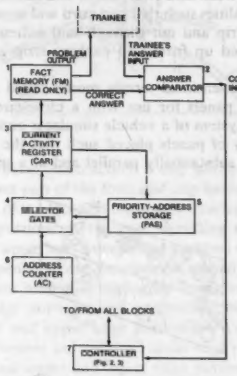
AUTOMATIC MEMORY TRAINER

Peter Turnquist, 24400 Geyserville Ave., Cloverdale, Calif. 95425

Continuation-in-part of Ser. No. 828,853, Aug. 29, 1977, abandoned, which is a continuation of Ser. No. 624,272, Oct. 20, 1975, abandoned. This application Jul. 31, 1978, Ser. No. 929,688

Int. Cl.[2] G09B *7/04*

U.S. Cl. 35—9 A **32 Claims**



1. Apparatus useful by a trainee to facilitate learning, said apparatus comprising:

memory means for storing a plurality of data items;

first sequencing means for selecting data items from said memory means;

additional sequencing means for making multiple selections of the same data item and separating successive selections of such item by an interval comprising one or more selections of other data items;

interval variation means for automatically varying said interval from one predictable magnitude to another predictable magnitude;

output means, responsive to each data item selected, for transmitting data, as defined by said selected data item, to a trainee;

input means for receiving the trainee's response corresponding to the transmitted data; and

classification means, responsive to the selected data and to the responses by the trainee, for determining whether responses by the trainee are good or bad and for classifying data items as subject to selection by said additional sequencing means.

4,193,211

MODULAR TERRAIN MODEL BOARD ASSEMBLY AND METHOD OF BUILDING SAME

Martin Dotsko, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Aug. 17, 1978, Ser. No. 934,353

Int. Cl.[2] G09B *25/08*

U.S. Cl. 35—12 N **8 Claims**

1. A method of joining a multiplicity of panels making up the three-dimensional model board used with a closed-circuit television visual display system of a vehicle simulator comprising the steps of:

placing the edges of two panels representing contiguous areas of simulated terrain substantially parallel and at a spaced distance from each other such that when said two panels are viewed together they represent one larger continuous area of simulated terrain, each of said panels of

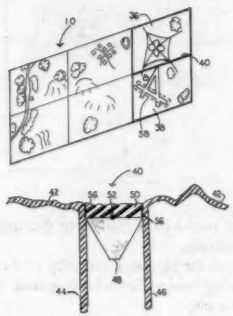
terrain including a surface area and extended edges around the perimeter of said panels;

inserting a packing strip in said spaced distance, below said surface area of each said panel and in contact with said parallel edges, said packing strip further including a cord attached to a surface of said packing strip at spaced intervals; and

filling the seam defined by said edges of said panels and said packing strip with an adhesive compound up to a level of said surface areas of said panels to obtain a continuous terrain between said two panels, said adhesive compound having qualities such that said cord will separate from said packing strip and cut through said adhesive compound when pulled up from said packing strip and along said seam.

5. A three-dimensional terrain model board made up of a multiplicity of panels for use with a close-circuit television visual display system of a vehicle simulator comprising;

a multiplicity of panels placed such that the edges of two panels are substantially parallel and at a spaced distance



from each other such that when said two panels are viewed together they represent a larger continuous area of simulated terrain, said panels including a surface area simulating said terrain and extended edges around the perimeter of said panels;

a packing strip inserted in said spaced distance between said edges of two parallel panels representing contiguous areas of a simulated terrain, said packing strip being placed below said surface area of each panel and in contact with said parallel edges and further including a cord detachably secured to a surface of said packing strip at spaced intervals; and

an adhesive compound applied to the seam defined by said edges of said panel and said packing strip, said adhesive compound applied in sufficient quantity to fill said seam up to said surface area of said panels to obtain a continuous terrain between said two contiguous panels, said adhesive compound, having qualities such that said cord will separate from said packing strip and cut through said adhesive compound when pulled up from said packing strip and along said seam.

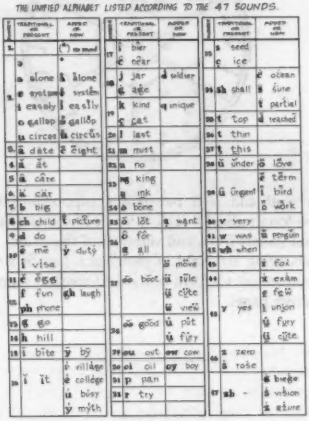
4,193,212

UNIFIED ENGLISH PRONOUNCING ALPHABET

Hassan A. Al-Kufaishi, P.O. Box 124, Bloomington, Calif. 92316

Filed May 17, 1978, Ser. No. 890,538
Int. Cl.[2] G09B *17/00*
U.S. Cl. 35—35 R **1 Claim**

1. A set of diacritic marks that allows the word to be read with self-pronunciation while still using the normal traditional spelling of the word, said set of 24 new marks covering 47 sounds to operate in conjunction with certain chosen traditional diacritics together with rules of application pertaining to the entire set, comprising a double-dash over "ē" for sound of long "ā"; a cap over "î" for sound of "ch"; double-dotted "i̇̇" and "ẏ" for sound of long "ē"; rule that "gh" has sound of "f" except when it is silent; vertical dash over letters "a̍," "e̍," "u̍," and "y̍" for short "i̍" sound; macron over "ȳ" for long "i̍" sound; general rule to consider "y" the same as "i̍" when being marked with diacritics; dot over "d̈" for "j" sound; "q" for sound of "k" always; under-dotted "a" for sound of breve "ă"; single mini-circle over "û" and underscored "u̲" for sound of breve ligatured "o͝o"; double mini-circle over "o͞o," "u͞," under-



scored "u̲," and "w̲" for sound of long ligatured "o," ("o͞o"); "ow" for sound of "ou"; "oy" for sound of "oi"; tri-dots in triangle form over "c̈," "s̈," and "z̈," dash over "d̈" for sound of "t"; underlined breve mark (u̲) over "ŭ" for breve "ŭ"; overlined circumflex (o͞) over "e͞," "i͞," "o͞," for sound of "u"; double dots over "g̈," "s̈," and "z̈," for sound of "zh"; a mini "x", the omission mark, over any letter of the alphabet which is silent; all marks being made while maintaining the orthography intact.

4,193,213

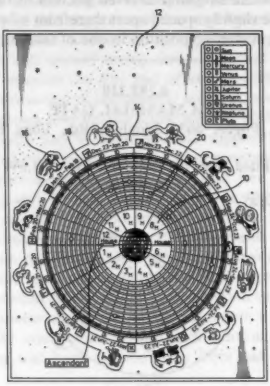
ASTROLOGICAL FORTUNE-TELLING DEVICE

Kataro Suda, Tokyo, Japan, assignor to Suda Kinzoku Seisakusho Co. Ltd., Tokyo, Japan

Filed Jul. 10, 1978, Ser. No. 922,976
Claims priority, application Japan, Oct. 13, 1977, 52-122878
Int. Cl.[2] G09B *29/00*; A63F *9/18*
U.S. Cl. 35—44 **8 Claims**

1. An astrological fortune-telling device which comprises a base plate having twelve divisions of houses, a plate which is provided with the twelve depicted constellation signs and mounted rotatably on a center of the twelve divisions of said base plate, orbits concentrically arranged around said center for placement of markings which correspond to the sun and the planets excluding the earth at any position, a transparent cover

placed over said base plate with said rotatable plate, and a transparent disk provided with fan-shape areas which is sur-



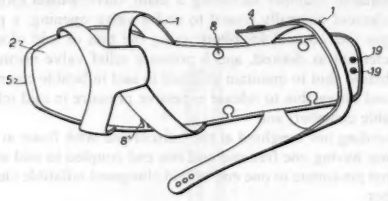
mounted removably on said transparent cover and rotatable in relation to the center of said rotatable plate.

4,193,214

CHANGEABLE SANDAL

Chin-Yuan Wang, No. 15, Hsi-An Rd., Pu-Li Town, Nan Tou, Taiwan (545)

Filed Nov. 28, 1977, Ser. No. 855,437
Int. Cl.[2] A43B *3/12, 3/24*
U.S. Cl. 36—11.5 **6 Claims**



1. A sandal formed of attachable elements which are individually replaceable comprising:

a binding element having an inside surface and a plurality of fasteners on said inside surface and having two end portions;

a vamp having opposed L-shaped ends, each of said ends having a base and vertical portion;

a sole having a heel portion and having a plurality of cut-out fastening regions and a plurality of angular indentations in the side thereof, each of said fastening regions corresponding to one of said fasteners, each of said fastening regions being adapted to receive therein said corresponding fastener, each of said indentations corresponding to one of said L-shaped ends, each of said indentations being adapted to receive therein the base portion of said corresponding L-shaped end, the vertical portion of said L-shaped end abutting said side of said sole;

said binding element surrounding and molding to said side of said sole, holding said base portion of each said L-shaped ends fitting in said corresponding indentation and holding said vertical portion of each said L-shaped end abutting the side of said sole, thereby detachably joining said sole, vamp and binding element; and

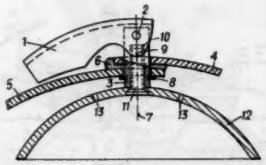
means for detachably locking the heel portion of said sole to said binding element end portions.

4,193,215

FASTENER FOR INSTEP PORTION OF SKI SHOE

Adolf Hensler, Koflach, Austria, assignor to Koflach Sportgerate Gesellschaft m.b.H., Koflach, Austria

Filed Jul. 10, 1978, Ser. No. 923,444
Int. Cl.[2] A43B *11/00, 5/04*
U.S. Cl. 36—50 **9 Claims**



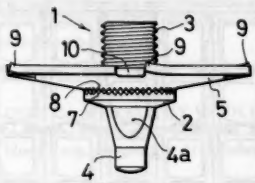
1. In a ski shoe construction: a cup portion which in use covers the front part of the foot, said cup having a slot overlying the instep of the foot and formed by overlapping upper and lower edge portions of the cup; a pulling element passing through said upper and lower edge portions of said slot in a direction perpendicular to the planes of said edge portions, said pulling element having an upwardly facing surface engaging said lower edge portions; and a tightening element arranged outwardly of said upper edge portion and cooperating with said pulling element and with said upper edge portion to releasably clamp said upper and lower edge portions together in a direction perpendicular to the planes of said edge portions whereby said clamping does not result in movement of said edge portions in their planes.

4,193,216

SPIKE ASSEMBLY FOR SPORTS SHOES

Takeshi Ueda, 13-11, Kuruwa-cho, Gunma-ken, Isezaki-shi, Japan

Filed Oct. 11, 1978, Ser. No. 950,296
Int. Cl.[2] A43C *15/00*
U.S. Cl. 36—67 D **2 Claims**



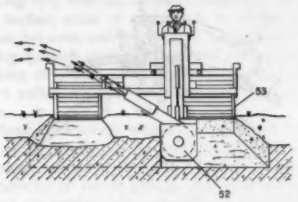
1. A spike assembly for a sports shoe comprising a spike body formed at its one end portion into a screw element and at its other end portion into a spike element and having at its middle portion a flange provided with a serrated surface facing said screw element; a washer provided with a serrated surface and loosely mounted at its center opening, which is somewhat larger in diameter than the screw element, on the screw element, so that the flange and the washer face one another at their respective serrated surfaces, said surfaces being engageable one with another to prevent turning; and an annular member made of synthetic resin mounted at its opening, which is somewhat smaller in diameter than the screw element, on the screw element so as to support the washer from the outside thereof; said washer being provided at its peripheral edge with turning proof projections adapted to be engaged with the sole of the shoe.

4,193,217

PIVOTABLE BUCKET WITH A ROTATABLE EARTH MOVING MECHANISM

John M. Poche, 6317 Franklin Ave., New Orleans, La. 70122

Filed Sep. 29, 1977, Ser. No. 837,846
Int. Cl.[2] E02F 3/24
U.S. Cl. 37—93 9 Claims



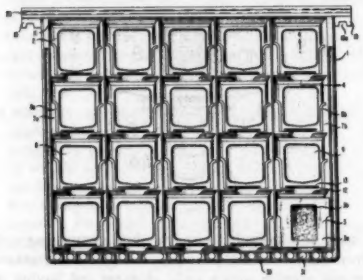
1. A bucket pivotably secured to the outer end of an elbow-type power boom attached to a carrier vehicle having hydraulic power, an earth moving mechanism comprising a rotatable wheel-like structure provided with a plurality of equally spaced and outwardly extending earth ejecting blades integral with said wheel-like structure and being provided additionally with support vanes and a retaining support ring, the wheel-like structure being mounted on a horizontally disposed power shaft having a shredder blade mounted on the outer end of the power shaft and a hydraulic motor mounted in the bucket and connected to the shaft by a reduction drive mechanism and a combination shear blade and compression plate forming a compression chamber in the upper portion of the bucket.

4,193,218

TRANSLUCENT STORAGE PAGES FOR FILING FILM SLIDES

Leon Mermelstein, Rockaway, N.J., assignor to Franklin Distributors Corporation, Morris Plains, N.J.

Filed Apr. 13, 1978, Ser. No. 896,139
Int. Cl.[2] G09F 1/10
U.S. Cl. 40—374 5 Claims



1. A self-supporting unitary slide storage page for holding and viewing photographic slides, comprising a sheet of translucent plastic material of archival character;

said sheet comprising retaining means, including a number of contiguous rectangular trays which are spaced apart in a lateral and longitudinal patterned relationship;

each of said trays being adapted to hold a photographic slide, and including integral projecting tabs for holding said slide in storage position in said tray;

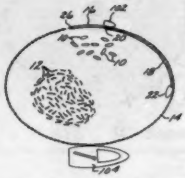
each said tray having a slightly recessed rectangular central base portion which is surrounded on its inner periphery with a slightly raised frame constructed for contact with the edge mounts of said photographic slides, the shape of said recessed central base portion constructed to substantially correspond in lateral extent to at least exceed the extent of the emulsion-covered portion of the said slides and to be slightly spaced apart therefrom when one of said slides is in storage position in one of said trays.

4,193,219

SEA MAMMAL GATE

Clarence W. Pogue, 6631 Monaco Rd., Long Beach, Calif. 90808

Filed Dec. 19, 1977, Ser. No. 861,691
Int. Cl.[2] A01K 73/02
U.S. Cl. 43—14 7 Claims



1. A sea mammal gate for use with a seine net and connected in lieu of floats along a portion of the upper edge thereof, comprising;

at least one elongated inflatable chamber;

a compressed gas line leading to said inflatable chamber; and

a valve assembly interposed between said inflatable chamber and said compressed gas line for selectively admitting gas to and exhausting gas from said inflatable chamber, thereby altering the bouyancy characteristics of said inflatable chamber including a main valve with a closure element normally biased to seal a valve opening, a pilot gas line control for overcoming the bias of said closure element as desired, and a pressure relief valve normally biased shut to maintain pressure in said inflatable chamber and unsealable to release excessive pressure in said inflatable chamber; and

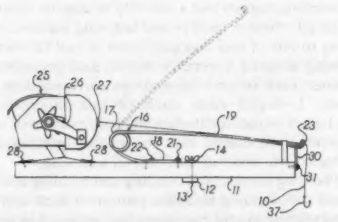
a herding net weighted at the bottom and with floats at the top having one free end and one end coupled to said seine net proximate to one end of said elongated inflatible chamber.

4,193,220

FISHING APPARATUS

George W. Bourquin, 710 Sierra Rd. West, and Louis LaFontain, 1627 Hollins Ave., both of Helena, Mont. 59601

Filed Feb. 6, 1978, Ser. No. 875,290
Int. Cl.[2] H01K 97/00
U.S. Cl. 43—15 8 Claims



1. Fishing apparatus including a longitudinal support member, a pivotable cross member securable in a position transverse of said support member, a coil spring member having a coil portion and substantially straight arms extending a signifi-

cant distance from each end of said coil portion, one of said arms of said coil spring member being affixed to said support member so a second arm of said spring member is disposed longitudinally of said support member and biased away from said support member, said second spring arm being of a length so that when said second spring arm is disposed adjacent to said support member the free end of said second spring arm extends beyond an end of said support member, said free end of said second spring arm having a line-guiding portion, a rotatable line storage reel mounted on said support member between said coil portion of said coil spring member and the end of said support member remote from said free end of said second spring arm, locking means engageable with said second spring arm mounted on said support member, said locking means including a hook portion at the free end thereof, and latching means mounted on said support member adjacent said free end of said second spring arm; said latching means including a hook portion engageable with said second spring arm and pivotable transversely of said support member, a support portion pivotally connected to said hook portion, and biasing means urging said hook portion away from said support portion.

4,193,221

TOY BUILDING

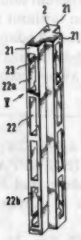
Hans Beck, Oberasbach, Fed. Rep. of Germany, assignor to geobra Brandstaetter GmbH & Co., KG, Zirndorf, Fed. Rep. of Germany

Filed Jan. 30, 1978, Ser. No. 873,328

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1977, 2704204

Int. Cl.[2] A63H *33/06*

U.S. Cl. 46—19 **28 Claims**



1. A toy building set for constructing a toy building comprising a plurality of wall plates each having lateral edge portions, said lateral edge portions having anchoring elements thereon, said wall plates forming sections of the outer wall of the toy building, a plurality of connecting members each having a plurality of recesses for receiving said anchoring elements, said recesses being defined at least partially by opposed recess walls, said opposed recess walls being spaced from one another a distance greater than the thickness of said anchoring elements, at least some of said opposed recess walls having clamping bars extending from said opposed recess walls, said clamping bars being offset relative to one another such that the clamping bar on one recess wall is displaced in a non-opposed position relative to the clamping bar on the opposed recess wall, said clamping bars having terminating ends which engage said anchoring elements, said wall plates being made of a resilient material, said terminating ends of said clamping bars on said opposed recess walls being spaced from one another such that upon insertion of an anchoring element into the recess, the anchoring element is lightly distorted to thereby provide a clamping securement.

4,193,222

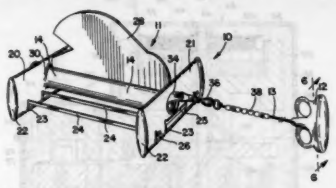
AUDIBLE AND LUMINOUS SWINGABLE TOY

Eugene A. Deschand, 148 N. Grand Ave., Bradley, Ill. 60915

Filed Aug. 7, 1978, Ser. No. 931,850

Int. Cl.[2] A63H *5/00*; C09K *3/00*

U.S. Cl. 46—52 **12 Claims**



1. An audible and luminous swingable toy for swinging in an orbit, said toy comprising:

an elongate and tubular central body portion, said body portion being of transparent or translucent material;

light emitting means disposed in said tubular body portion for illuminating the body portion;

a first elongate end piece secured to said body portion near one end thereof in generally perpendicular relationship thereto;

a second elongate end piece secured to said body portion near an opposite end thereof in generally perpendicular relationship thereto;

a plurality of apertures in said first and second end pieces at spaced points therealong;

a plurality of vibratory members disposed in said apertures between said first and second end pieces such that said vibratory members are in generally parallel and spaced apart relationship, said vibratory members adapted to emit audible noise frequencies upon excitation by air currents while swinging in said orbit;

stabilizing fin means disposed perpendicularly to a plane defined by said vibratory members for orienting and maintaining said vibratory members perpendicular to another plane defined by said orbit;

cord means attached to one end of said central tubular body portion; and

twist relieving means disposed in said cord means to relieve twisting in said cord means such that said vibratory members tend to remain oriented in a plane perpendicular to the plane defined by said orbit.

4,193,223

INERTIA WHEEL TOY VEHICLE

Bruce M. D'Andrade, Flemington, N.J., and Kwok Wa Tsui, WanChai, Hong Kong, assignors to Arco Industries Ltd., New York, N.Y.

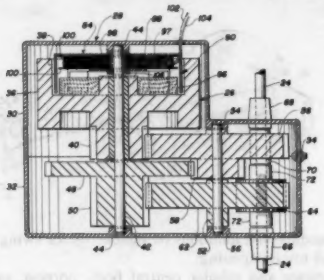
Filed May 25, 1978, Ser. No. 909,540

Int. Cl.[2] A63H *29/20*

U.S. Cl. 46—209 **6 Claims**

1. A wheeled toy adapted to run along a supporting surface and having a body and at least one current conductible axle rotatably supported thereby with wheels on the ends of said axle, an inertia type flywheel rotatably supported by said body for rotation about a fixed axis, and a speed-changing gear train connected between said flywheel and at least one of the wheels of said toy comprising a drivewheel, said toy when rolled along said supporting surface by applied force rotating said flywheel to store kinetic energy therein and upon release of the toy said stored energy to said flywheel drives at least one wheel of said toy to propel the toy along said surface, in combination with an auxiliary electric device mounted upon said toy, an electric generator connected to said flywheel for operation thereby to generate electric current, said generator comprising a permanent magnet and a field including a coil, one of the latter items being fixedly supported by said body of said toy

and the other being connected to said flywheel for rotation therewith relative to said fixedly supported item, a pair of contacts supported upon said body for contact with said axle, and a circuit connecting said auxiliary electric device in series



with said contacts and the opposite ends of said coil, whereby electric current generated by said generator is delivered to said auxiliary electric device to activate the same, when said flywheel is rotating said generator to generate electric current.

4,193,224

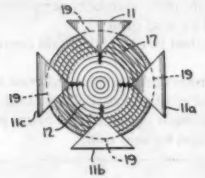
STEM GROWTH CONTROL DEVICE AND METHOD

Henry H. Turner, 2702 Techwood Dr., Columbus, Ga. 31906

Continuation of Ser. No. 745,324, Nov. 26, 1976, abandoned, which is a continuation of Ser. No. 610,771, Sep. 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 429,392, Dec. 28, 1973, abandoned. This application Jan. 5, 1979, Ser. No. 1,188

Int. Cl.[3] **A01G** *1/00*

U.S. Cl. 47—58 **29 Claims**



1. A method for limiting growth of a plant at a selected level for control of translocation past said level, comprising the step of confining growth to at least one slot at said level, said slot extending outwardly from said plant and being transverse to channels for translocation of metabolites at said level and being delineated laterally on each of its respective sides by an edge of a plate of material maintained transverse to said channels and strong and rigid enough to resist the pressure of growth while functioning adequately as a template or pattern for limitation of growth, each said edge serving to limit growth at and perpendicular to the respective said edge while allowing relatively free growth at and parallel to the respective said edge, so that, in and immediately adjacent to a surface transverse to said pathways and surrounding said plant at the time of initiation of said method and defined by and lying within said slot and said material, growth occurs in said slot and not in the portion of said surface occupied by said material, with, after such growth, an ultimate area occupied by said plant in said surface smaller because of and in proportion to the degree of said limitation, there being produced thereby a narrow pass, or bottleneck, or insufficiency of means for translocation past said level.

4,193,225

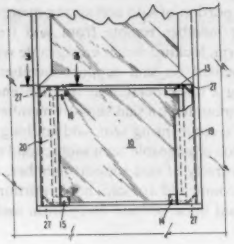
AUXILIARY WINDOW ELEMENT

Louis L. Posner, Huntingdon Valley, and Patrick J. McGarry, Wyndmoor, both of Pa., assignors to Thermal Economics, Inc., Pa.

Continuation-in-part of Ser. No. 825,989, Aug. 19, 1977. This application Aug. 8, 1978, Ser. No. 931,879

Int. Cl.[2] **E05C** *21/02*

U.S. Cl. 49—465 **1 Claim**



1. In an adjustable auxiliary window element adapted to fit in a window frame, said element having a window encased in a perimetric frame having side portions, a top portion, a bottom portion and four corner portions, the improvement which comprises:

adjustable extension means in the form of channels which telescopically engage said encased window laterally;

resilient means secured to said corner portions and extending within said channels and adapted to bias said channels outwardly, wherein said corner portions interfit with said top and bottom portions so as to enable vertical adjustment of said top or bottom portion by adjustment of a corner portion, and wherein said corner portions include a tab positioned thereon without said top and bottom portions and said channels and adapted to be gripped for ease of adjustment, and wherein said channels are formed with a free end extending away from said window for ease of adjustment.

4,193,226

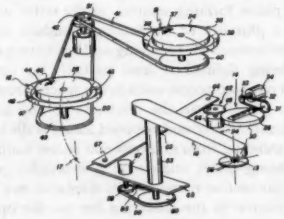
POLISHING APPARATUS

Gerald L. Gill, Jr., Scottsdale, and Philip J. Rioux, Glendale, both of Ariz., assignors to Kayex Corporation, Rochester, N.Y.

Division of Ser. No. 835,295, Sep. 21, 1977, Pat. No. 4,141,180. This application Aug. 30, 1978, Ser. No. 938,036

Int. Cl.[3] **B24B** *7/00*

U.S. Cl. 51—124 R **3 Claims**



1. Apparatus for polishing one surface of a thin, flat wafer of a semiconductive material, comprising:

at least one station having a flat, rotatable polishing surface;

carrier means pivotally mounted with respect to the one station including a self-levelling, rotatable pressure head having a chamber covered with a perforated, high-friction

material for retaining the wafer in contact therewith, the carrier means moving the wafer into the one station and over an area of the polishing surface between its periphery and its rotational axis, moving the wafer in a vertical direction to position and hold the same in the area and in contact with the polishing surface under pressure, and continuously rotating the wafer during such moving and holding;

means interconnected to the carrier means for oscillating the same for a period of time while the wafer is in contact with the polishing surface and is being rotated to polish the one surface;

means interconnected to the carrier means for controlling the movement thereof and for maintaining the wafer in contact with the polishing surface at the pressure and for the period of time; and

means interconnected to the chamber of the pressure head for connecting a source of a liquid thereto to wet the high-friction material for enhancing retention of the wafer thereby during movement and rotation of the wafer, for connecting a vacuum thereto for holding the wafer in contact with the high-friction material during movement and positioning of the wafer in the area, and for connecting a source of air thereto for ejecting the wafer from the high-friction material.

4,193,227

ADAPTIVE GRINDING CONTROL

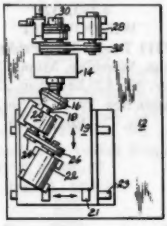
Herbert R. Uhtenwoldt, West Boylston, Mass., assignor to Cincinnati Milacron-Heald Corporation, Worcester, Mass.

Filed Jun. 21, 1978, Ser. No. 917,415

The portion of the term of this patent subsequent to Apr. 3, 1996, has been disclaimed.

Int. Cl.[2] B24B *49/16*

U.S. Cl. 51—165.77 **3 Claims**



2. A grinding machine for grinding workpieces with diverse grindability characteristics, comprising:

(a) a base;

(b) a grinding wheel rotably mounted upon said base;

(c) a workpiece support for supporting a workpiece with diverse grindability characteristics;

(d) means for effectuating relative infeed movement between said grinding wheel and said workpiece support;

(e) means for generating a signal whose magnitude varies as a function of the interface force between said grinding wheel and a workpiece supported in said workpiece support;

(f) first means utilizing said generated signal for increasing the infeed in response to an increase in said sensed force, said first means increasing the infeed until the interface force reaches a predetermined level; and

(g) second means utilizing said generated signal for decreasing the infeed in response to a decrease in said sensed force, said means decreasing the infeed until the interface force reaches a predetermined level.

4,193,228

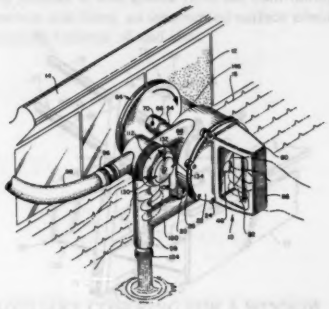
WATER DRIVEN TOOL

Donald F. Bowler, 7942 Moorcroft Ave., Canoga Park, Calif. 91304

Filed Dec. 19, 1977, Ser. No. 862,030

Int. Cl.[2] B24B *23/02*

U.S. Cl. 51—170 T **6 Claims**



1. A water driven hand tool, comprising:

a water driven turbine,

a turbine housing enclosing said turbine,

a turbine shaft mounted for rotation in said housing,

said turbine being mounted on said shaft for rotation therewith,

a housing inlet connected to supply water under pressure to rotatably drive the turbine,

a housing outlet to discharge said water from said housing after it has acted on said turbine,

an external shaft connected to said turbine shaft to rotate therewith,

tool means on the end of the external shaft to be rotated thereby,

a valve in said inlet to open and close the inlet to the housing, and

a by-pass pipe connected to said inlet and to said valve, said by-pass pipe having a discharge connected to said housing outlet downstream of said valve and said inlet,

said valve in a first position being operable to supply water to said housing through said inlet and to shut off water to said by-pass pipe,

said valve in a second position being operable to shut off water to said inlet to said housing and to discharge water through said by-pass pipe,

said valve in a third position being operable to shut off water to said housing and said by-pass pipe,

said outlet being connected to said by-pass pipe so that during normal operation of said turbine, when said valve is in said first position, said water discharges through said by-pass discharge.

4,193,229

HANDRAIL FOR TELESCOPING SEATING SYSTEM WITH REMOVABLE RAILS

Arlin P. Hartman, Champaign, Ill., assignor to American Seating Company, Grand Rapids, Mich.

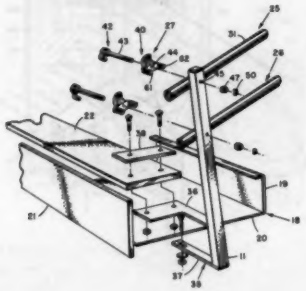
Filed Aug. 7, 1978, Ser. No. 931,759

Int. Cl.[2] E04H *3/12, 17/20*

U.S. Cl. 52—9 **8 Claims**

1. In combination with a telescoping seating system having a plurality of telescoping rows arranged in stepped relation in the use position; a handrail comprising a plurality of post mounted to the sides of respective rows and extending upwardly thereof; upper and lower elongated rail means spanning said posts in the use position; and a clamp assembly for releasably clamping each of said rail means to each of said

posts, each clamp assembly comprising a locking bolt rotatably received in an associate post, a clamp nut including a clamp surface adapted to engage and hold said rail means, said clamp nut received on said bolt and movable axially thereof between a clamping position in which said clamp surface engages and secures said rail means and a release position in which said clamp surface is free from said rail means, one of said bolt and



clamp nut including a cam element and the other providing a cam surface, said cam element and cam surface cooperating in limited rotary motion to cause said clamp surface to engage and hold said rail means when said bolt is turned in one direction and to release said clamp surface from said rail means to permit said rail means to be removed when said bolt is turned in the other direction.

4,193,230

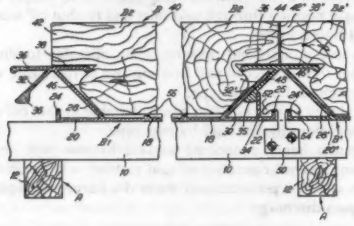
COVERING FOR BUILDING STRUCTURES AND RELATED INSTALLATION METHOD

Renato Pinna, Corso Tintori 19, Florence, Italy

Filed May 15, 1978, Ser. No. 905,977

Int. Cl.[2] E04B *1/10, 1/38*

U.S. Cl. 52—90 **13 Claims**



1. Covering for a roof or wall structure for buildings in general, consisting of elements mutually coupeable and able to be connected to the supporting frame of the structure, characterized by a plurality of parellely located plates (B1) having longitudinal edges (24, 25) extending from the bottom to the top of the roof or wall structure and provided, at least along a portion of the longitudinal edges (20, 22) thereof, with means (30, 34, 32') for a mutual connecting and tight closing and with fixed-joint type members (36, 38) extending as a ridge along the longitudinal edges of said plates and effective to hold covering bodies (B2) against said plates, further characterized in that the plates (B1) terminate at the longitudinal ends thereof with coplanar fins (20, 22) therewith anchoring members clamping said plates against the base frame (A) engage.

4,193,231

SILLS FOR BUILDING CONSTRUCTION

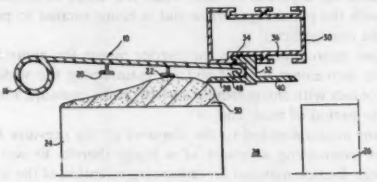
George Molyneux, Plymouth, England, assignor to Radway Plastics Limited, Solihull, England

Filed Feb. 21, 1978, Ser. No. 879,565

Claims priority, application United Kingdom, Jan. 28, 1978, 3583/78

Int. Cl.[2] E06B *1/70*

U.S. Cl. 52—97 **14 Claims**



1. A structural assembly comprising an elongate structural element for use in a frame in an opening in the wall of a building, said structural assembly defining an effective pocket open along one side thereof, and a sill which comprises an elongate plate-like element formed with an inner edge portion comprising an arcuate surface, as seen in transverse section, said inner edge portion being received within said pocket and said plate-like element extending from said structural element; the width of said pocket being greater, measured from the outside open edge of said structural element to the inner end of said pocket, than the cross-sectional width of said inner edge portion, whereby said sill, while said inner edge portion is retained in said pocket, may be both pivoted about its inner edge portion and adjusted laterally with respect to said elongate structural element.

4,193,232

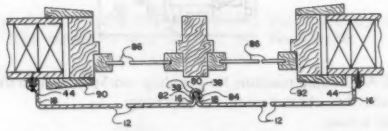
WINDOW CAP

Richard Almsted, 7311 Tempo Ter., Fridley, Minn. 55432, and Verlyn V. Ellertson, Wyoming, Minn. 55092

Continuation of Ser. No. 827,064, Aug. 23, 1977, abandoned. This application Sep. 29, 1978, Ser. No. 946,742

Int. Cl.[2] E06B *3/28*

U.S. Cl. 52—98 **8 Claims**



1. In combination with a wall of a building including a window and window frame unit mounted in the building wall,

a window cap attached in fixed sealed relation to the building wall and completely enclosing the window and frame unit, said window cap comprising:

a window pane having a peripheral edge; and also having

a peripheral spacer element extending around said window pane peripheral edge and being larger in all dimensions than the window frame to completely surround and enclose the window and frame unit,

said peripheral spacer element being sufficiently thick to space said pane outwardly from the window and frame unit, and

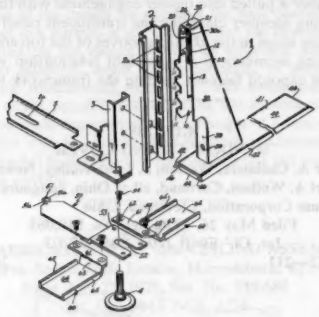
means for sealing the spacer elements to a portion of said building wall surrounding and enclosing said window frame.

4,193,233

ADJUSTABLE PANEL STABILIZER

Harold L. VandenHoek, and Frank S. Breiner, both of Grand Rapids, Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed May 24, 1978, Ser. No. 909,120
Int. Cl.[2] E04D *15/00*
U.S. Cl. 52—122 23 Claims



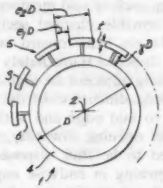
1. In a stabilizer having attachment means for attaching the stabilizer to a free standing panel, the improvement comprising: said stabilizer including a vertical leg which is at least partially hollow on the interior therof, said hollow interior opening to the rear of said leg; track means located within said hollow of vertical leg, said attachment means being movably mounted upon said track means within said stabilizer leg and projecting rearwardly through said opening; adjustment means securing said attachment means to said stabilizer whereby one can move the attachment means up or down on said track means within said stabilizer leg by operating said adjustment means thereby facilitating adjustment of the stabilizer relative to a panel without actually changing the level of the stabilizer foot on the floor on which it rests.

4,193,234

STABILIZING OF STRUCTURES

Henry H. Y. Wong, Bearsden, Scotland, assignor to National Research Development Corporation, London, England

Filed Feb. 24, 1978, Ser. No. 881,050
Claims priority, application United Kingdom, Feb. 24, 1977, 07911/77; Aug. 13, 1977, 34089/77
Int. Cl.[2] E04H *9/14*
U.S. Cl. 52—173 R 12 Claims



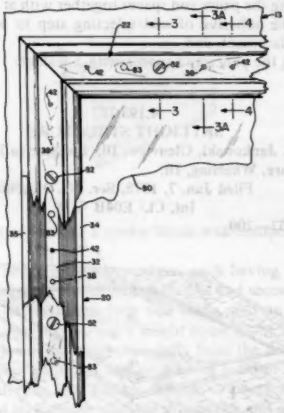
1. A structure intended to operate while at least partially immersed in relatively-moving fluid and including a stabilising device carried by said structure, said stabilising device comprising a plurality of slats, said slats being arranged so as to form at least one shroud around at least part of the periphery of said structure, said slats being spaced apart from each other in a peripheral direction whereby said shroud is peripherally discontinuous and whereby slot-shaped gaps extending substantially the full axial length of said shroud are formed between each adjacent set of slats, said shroud being spaced from said structure whereby a passage to receive a proportion of said relatively-moving fluid by way of said slot-shaped gaps is formed between said structure and said shroud, said passage having substantially smooth, spaced confronting inner and outer walls whereby to permit high intensity turbulent flow within said passage of said received fluid, said inner wall of said passage being formed by a continuous surface of said structure, and said outer wall of said passage being a surface substantially parallel to and spaced from the confronting wall of said structure and being an interrupted surface constituted by inward-facing surfaces of said slats.

4,193,235

AUXILIARY COVERING FOR A WINDOW

Philip M. Cucchiara, 17304 Winslow Rd., Shaker Heights, Ohio 44120

Filed Jun. 14, 1978, Ser. No. 915,398
Int. Cl.[2] E06B *3/26*
U.S. Cl. 52—202 13 Claims



1. An auxiliary covering for a window positioned in a stationary window frame and comprising:

a base frame strip and a top frame strip having complementary shaped engaging surfaces including at least one longitudinally extending rib and groove on the different strips, said base frame strip having a back surface adapted to be positioned on a window frame, wall surface or the like,

said base frame strip having a series of nails extending therethrough from its back surface and protruding upwardly from the strip less than the thickness of said top frame strip,

a plastic sheet having an edge length thereof impaled on said nails, and

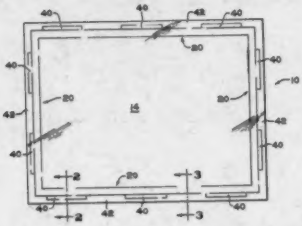
means securing said frame strips together, said plastic sheet being in sealed engagement with and between said frame strips, said top frame strip having an inner surface contacting said plastic sheet and one or more openings in such inner surface for receiving the upper ends of said nails, said base frame strip being secured to the window frame.

4,193,236

MULTIPLE GLAZED UNIT HAVING AN ADHESIVE CLEAT

Renato J. Mazzoni, Tarentum; George R. Mistrick, Leechburg, and Barent A. Rosskamp, Tarentum, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 30, 1978, Ser. No. 873,326
Int. Cl.[2] E06B 7/12
U.S. Cl. 52—172 **22 Claims**



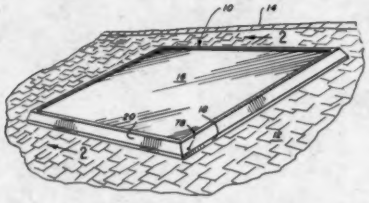
1. A method of making a multiple glazed unit to prevent spacer displacement comprising the steps of:
- mounting a spacer between a pair of panes to provide an airspace therebetween;
- selecting an adhesive having a shear property of greater than about 40 pounds per square inch (2.80 kilograms per squre centimeter) to prevent spacer displacement;
- securing the panes and spacer together with at least one cleat of the adhesive of said selecting step to prevent spacer displacement; and
- sealing the panes and spacer with a sealant.

4,193,237

SKYLIGHT STRUCTURE

Dieter K. Jankowski, Glenview, Ill., assignor to Imperial Glass Structure, Wheeling, Ill.

Filed Jun. 7, 1978, Ser. No. 913,506
Int. Cl.[2] E04B 7/18
U.S. Cl. 52—200 **4 Claims**



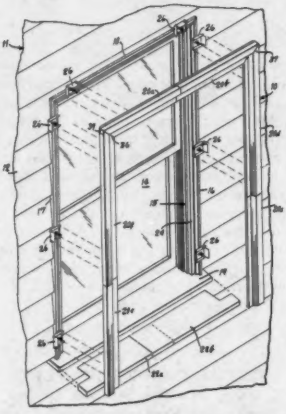
1. In a skylight structure for mounting on a flashed curb frame on residential buildings or the like having a single translucent glazing panel and a framework supporting said panel, the improvement comprising:
- a top framing member of said framework having a horizontal wall with a downwardly facing glazing groove at one end and a depending wall at the other end, said top framing member further including a wall depending from the underside of said horizontal wall terminating in a fork shaped channel; and
- a bottom framing member of said framework having a generally horizontal portion including an elevated bridge section having a pair of leg walls extending downwardly from the horizontal span of the bridge and terminating in a pair of spaced apart feet for mounting on top of the flashed curb frame, an upwardly facing glazing groove at one end of the bridge span, and a pair of walls extending upwardly intermediate the bridge span defining a U-shaped channel on top of the bridge span for receiving the forked shape channel of the top framing member therebetween, said bridge span having predrilled holes intermediate the channel walls and spaced apart at predetermined intervals so that a self-threading fastener can be passed between the feet and legs of the bridge span on the bottom framing member and extended through the predrilled hole into engagement with the inside walls of the fork shaped channel so that by tightening the fastener, the top framing member is pulled into tighter engagement with the bottom framing member clamping the translucent panel between glazing strips in the glazing grooves of the top and bottom framing members in a watertight relationship without a single exposed fastener holding the framework together.

4,193,238

WINDOW CASING COVER

Alexander A. Chalmers, Warren; J. Lynn Gailey, Newton Falls, and Carl A. Wollam, Cortland, all of Ohio, assignors to Alcan Aluminum Corporation, Cleveland, Ohio

Filed May 26, 1978, Ser. No. 910,063
Int. Cl.[2] E06B 1/04; E04F 19/02
U.S. Cl. 52—211 **24 Claims**



1. A window casing cover kit capable of being assembled on and in covering relation to a window casing at least partially surrounding a window opening, said cover kit comprising:
- (a) a plurality of case molding members for covering said window casing, each of said members being an elongated resiliently deformable channel section having opposed longitudinal flanges bent toward each other and being adapted to be disposed immediately outwardly of a portion of said casing adjacent an edge of the window opening with the long dimension of the channel section oriented parallel to said edge and with the channel of the channel section opening inwardly, said members being further adapted to be thus disposed one after another around said opening in endwise engagement with each other thereby to cover said casing;
- (b) a plurality of brackets for securing said members to said window casing, each of said brackets comprising a base portion adapted to be mounted on a portion of said casing and a pair of spaced, parallel, generally C-shaped seat portions adapted to be positioned on the outer side of said base with both seat portions extending transversely of the long dimension of one of said members and adapted to be simultaneously gripped between the opposed flanges of said one member, when said base is mounted on a portion of said casing and said one member is disposed immediately outwardly thereof as aforesaid, said seat portions being dimensioned for snap-on engagement of said mem-

ber flanges with said seat portions, said brackets being further adapted to be mounted as aforesaid in spaced relation to each other on said casing around said window opening inwardly of said case molding members such that said case molding members are held on said casing by gripping engagement of their flanges with the seat portions of said brackets; and

(c) for each of said brackets, fastening means adapted to be positioned in engaging relation to the bracket and to a portion of the casing for securing the base portion of the bracket to a portion of the casing when the base portion is mounted on the casing portion as aforesaid, and being further adapted, when thus positioned, to permit self-aligning translational, rotational, and in-and-out movement of the bracket relative to the last-mentioned casing portion upon engagement of the flanges of a case molding member with the bracket seat portions as aforesaid when the bracket base portion is mounted on the last-mentioned casing portion.

4,193,239

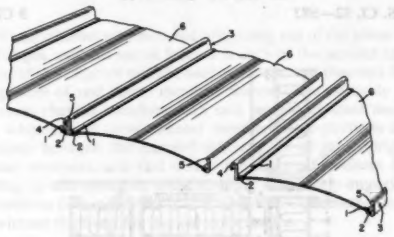
PREFABRICATED WALL OR CEILING ASSEMBLY

LeRoy Barto, Scenic Hills Estates, Harrodsburg, Ky. 40330

Filed Jun. 27, 1978, Ser. No. 919,688

Int. Cl.[2] E04B *1/04, 1/74*

U.S. Cl. 52—222 **1 Claim**



1. A wall or ceiling assembly comprised of two elongated units each having at least three panel engaging arms placed at an angle to the body of the units whereby panels so engaged are placed in tension, the elongated units having integral mating means for mating or crimping one of the mating means to the other, panels engaged by the panel engaging arms of the elongated units whereby tension in the panels caused by the angle of installation is transmitted back to the elongated units causing said elongated units to be pressed together said panels overlying one another with a space therebetween and insulating material contained in said space between the panels.

4,193,240

EXTERIOR WALL COMPOSITION

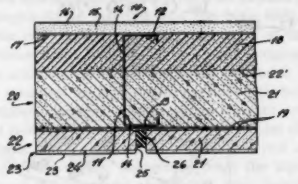
Hans F. Odoerfer, 12801 Monk Blvd., Pierrefonds, Quebec, Canada

Filed Aug. 10, 1978, Ser. No. 932,670

Int. Cl.[2] E04B *2/00*

U.S. Cl. 52—344 **10 Claims**

1. An exterior wall composition for building structures, comprising a lattice framework of rigid wall structural members, at least some of said wall structural members having inner and outer attachment means, an inner wall membrane secured to at least some of said inner attachment means of said wall structural members to define an inner wall having a finished outer wall surface, a sprayed layer of insulating material on an inner face of said inner wall membrane between said structural members, a reinforcing material layer having interstices secured to at least some of said outer attachment means to define an outer reinforcing wall membrane, a first sprayed layer of concrete material sprayed on said insulating material and extending outwardly of said reinforcing material layer and cured thereon whereby said wall structural members are completely embedded between said first sprayed layer of concrete material and said inner wall membrane, and a second thinner layer of



concrete material containing a bonding additive sprayed on an exterior surface of said first layer to constitute an outer wall surface.

4,193,241

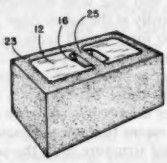
MASONRY BLOCK INSULATING DEVICE

Knud Jensen, 2929 E. Stewart Ave., Apt. 3, Las Vegas, Nev. 89101, and Ralph F. Cooper, 5251 New Bedford Cir., Las Vegas, Nev. 89122

Filed Dec. 5, 1977, Ser. No. 857,202

Int. Cl.[2] E04C *1/06*

U.S. Cl. 52—405 **5 Claims**



1. A method of forming a cinder block wall comprising the steps:

(1) forming insulating plug members, each having a generally rectangular cross-section with first and second opposite flat end walls and four side walls, and an integral protruding portion having a height equal to the height of a mortar joint extending outwardly from the first one of said flat end walls and said protruding portion having a substantially flat end surface capable of being moved in any lateral direction against the second flat end wall of an adjacent plug member when said wall is being formed to permit truing up the outer surface of the side wall, said protruding portion having a cross-sectional dimension so as to fill a substantial portion of the space between adjacent insulating plug members,

(2) inserting one of said plug members in each cavity of a plurality of blocks whereby said first and second flat end walls are substantially flush with top and bottom surfaces, respectively, of said cinder block, and said protruding portion extends outwardly from said cinder block approximately the height of a mortar joint,

(3) providing block surfaces with mortar,

(4) stacking successive blocks on one another to form said cinder block wall, and

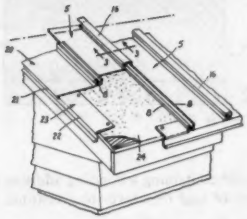
(5) moving the blocks laterally immediately after stacking as required to true up the outer surface of the block wall during construction, the flat end surfaces of each insert being in face to face relationship with the second flat end walls of adjacent inserts thereby permitting said lateral movement.

4,193,242

SHEET METAL ROOFING SYSTEM

Louis L. Vallée, 6392 Maubourg Ave., Montreal, Quebec, Canada (H1M 2C8)

Filed Apr. 10, 1978, Ser. No. 895,080
Int. Cl.[2] E04D *3/366*
U.S. Cl. 52—469 **3 Claims**



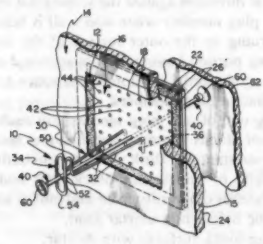
1. A metal roofing system of the batten type having a series of pan sections, each pan section formed of a single piece of pre-folded sheet metal having an elongated central base portion, two upstanding side walls, and a securing channel located outwardly of each upstanding side wall; each upstanding side wall having an inner member and an outer member, the said inner member being shorter in height than the outer member and in close contact with the outer member upwards from the said central base portion of the pan section, the said side wall members being folded inwardly and downwardly to form a lip spaced from the said side wall members; the said sheet metal being bent outwardly at the lower edge of the outer member of each side wall to form a said securing channel including an outer base portion lying in the plane of the central base portion and an outer edge portion bent upwardly a short distance at right angles to the outer base portion, each securing channel having in its outer base portion a series of apertures to receive securing means; means to secure the said securing channels to an underlying roof structure with the said outer edge portion of each securing channel of one pan section abutting the outer edge portion of a securing channel on an adjacent pan section; and a series of caps, each cap engaging with, said bridging the gap between, the facing sidewalls of adjacent pan sections.

4,193,243

PANEL REPAIR KIT

Francis L. Tiner, 3508 Coronado Dr., Sarasota, Fla. 33581

Filed Mar. 3, 1978, Ser. No. 883,144
Int. Cl.[2] E04G *23/02;* **B32B** *35/00*
U.S. Cl. 52—514 **19 Claims**



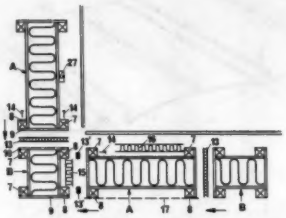
1. A kit for use in patching a hole in a panel of a hollow construction having a substantially fixed part spaced inwardly from and opposed to an inner face of the panel, the kit when operatively assembled comprising, means in the form of a substantially planar plate for insertion through the hole to be repaired and having a face for abutting engagement with the inner face of the panel substantially completely about the periphery of the hole, said plate having substantially equal sized perforations interlockable with a moldable patching material used in filling the hole, means in the form of a rod receivable in any one of said perforations and having a first end portion for seated engagement with the fixed part of the hollow construction, and means for positioning said plate in a desired position fixed to the panel for receiving the patching material while the hole is being filled, the positioning means comprising cooperating means for interengaging the rod with a portion of the plate containing the perforation receiving the rod and including the portion of said plate along a peripheral portion of the perforation which receives said rod and also including the adjacent periphery of said rod and operatively fixing said plate to said rod with said end portion of said rod seated against the fixed part of the hollow construction, and said positioning means further comprising adhesive retaining means positionable along said face of said plate for securing said plate to the inner face of the panel along the periphery of the hole to be patched.

4,193,244

BUILDING BLOCK AND MODULE SYSTEM FOR HOUSE BUILDING

Sture L. Samuelsson, Askvägen 2 D, 752 52 Uppsala, Sweden

Filed Apr. 18, 1978, Ser. No. 897,315
Claims priority, application Sweden, Apr. 19, 1977, 7704477
Int. Cl.[2] E04C *2/10*
U.S. Cl. 52—582 **9 Claims**



1. A module block for house building comprising two parallel-spaced base plates of wooden sheet material and of equal size and a heat insulating material disposed in the space between the base plates, wherein each of said base plates has an elongated support member of wooden material attached at each longitudinal edge thereof, the support members of at least one of said base plates being disposed on the outside of the module block, and wherein said parallel-spaced base plates are connected by means of a pair of side plates of thin wooden sheet material, which extend essentially perpendicular to said base plates and each of which is secured to one support member of one of said base plates and to one support member of the other of said base plates and wherein said base plates and side plates are constructed of different wooden materials from said support members.

4,193,245

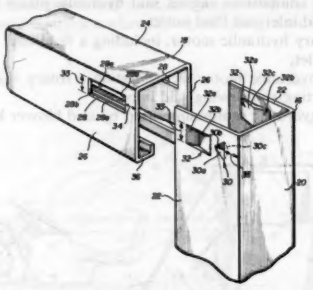
DOOR FRAME CONSTRUCTION

Larry K. Johnson, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.

Filed Aug. 3, 1978, Ser. No. 930,807
Int. Cl.[2] E04C *2/38*
U.S. Cl. 52—656 **12 Claims**

1. A door frame comprising; at least a pair of parallel, spaced apart upright channel members, and at least a pair of parallel spaced apart cross channel members assembled to said upright channel members and disposed generally perpendicular with respect to said upright channel members, said upright channel members and said cross channel members each include a web portion and two parallel side flanges, first interengagable coop-

erating means on said upright channel members and said cross channel members, which when engaged hold edge portions of said cross channel members in assembled relation with said upright channel members so as to substantially prevent disassembly, and second interengagable cooperating means on said upright channel members and said cross channel members which when engaged substantially prevent pivotal movement therebetween so as to maintain the assembled cross channel members and upright channel members in a substantially square relation and said first cooperating means comprises a detent member struck from each of the parallel side flanges of



one of said channel members and projecting out of the plane of said flanges, and slot means formed in each of the parallel said flanges of the other of said channel members, and disposed for engagement of said detent members therein upon assembly of said cross channel members with said upright channel members, wherein said cross channel members edge portions are insertable between the parallel side flanges of said upright channel members, and said detent members are resilient for yielding to said insertion, and thereafter snappingly engaging said resilient detent member in said slot means, effecting assembly without the need for manual deformation.

4,193,246

CLAMPING MEMBER FOR AN ADHESIVELY SECURED ANCHOR ROD

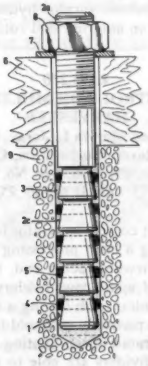
Erwin Schiefer, and Gusztav Lang, both of Münich, Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Jul. 18, 1978, Ser. No. 925,859

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2733007

Int. Cl.² F16B *13/04*

U.S. Cl. 52—698 **3 Claims**



1. Anchor rod to be secured in a bore hole or similar recess by means of a hardenable adhesive compound, said anchor rod comprising an axially extending rod having a front end inserted first into the bore hole and a rear end, at least an axial portion of said anchor rod having a maximum diameter circumferential surface thereon extending from the front end toward the rear end and arranged to be inserted into the bore hole, means arranged at the rear end of said rod rearwardly of said axial portion for connecting a load to the rod, and clamping means positioned on said axial portion of said rod insertable into the bore hole for retaining the rod within the bore hole before the adhesive compound sets wherein the improvement comprises that said axial portion of said anchoring rod includes clamping surfaces inclined at an angle to the axis of said rod with the clamping surface diverging outwardly from the axis in the direction toward the front end of said rod, said clamping surface diverging outwardly from a location inwardly of the maximum diameter circumferential surface of said rod to the maximum diameter circumferential surface thereof, said clamping surface comprises at least one frusto-conical surface encircling the axis of said rod with the smaller diameter end thereof being closer to the rear end of said rod and the larger diameter end being closer to the front end of said rod, said clamping means includes rolling bodies rollable on said clamping surface and elements in contact with said rolling bodies and holding the rolling bodies on the clamping surface, and the combination of said rolling bodies and elements projects outwardly beyond the maximum diameter circumferential surface of said axial part of said rod before any load can be applied, said rolling bodies are balls and said element is an annular elastomeric sheathing holding said balls therein with said sheathing completely encircling said clamping surface and arranged to maintain said balls in continuous contact with the wall of said bore hole, and before any load is applied said sheathing and balls are located at the smaller diameter end of said clamping surface.

4,193,247

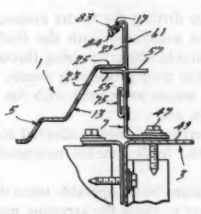
PANEL MOUNTING CLIP

Robert E. Heckelsberg, Germantown, Tenn., assignor to AMCA International Corporation, Hanover, N.H.

Filed Feb. 6, 1978, Ser. No. 875,533

Int. Cl.² E04D *1/34*

U.S. Cl. 52—713 **3 Claims**



1. A panel mounting clip assembly for interengagement with overengaged longitudinal edges of a pair of adjacent panel members and for attaching them to a panel support member, comprising a base member having a bottom flange adapted to be fastened to said support member and a web extending transversely to said bottom flange, said web having a slot therein extending substantially parallel to said bottom flange and to the length of a panel connected to the clip, a flexible tab having a holding portion formed therein and extending through said slot, said tab having a web on one side of said base member web and said holding portion having flange means on the other side of said base member web, said flange means and tab web resiliently gripping said base member web, said tab having a width substantially less than the length of said slot and being slidable along the length of the slot, said tab having an arm projecting as cantilever above said base member and adapted to interfit with and be crimped to said panel edges, said base member

having shelf flange means extending laterally from and substantially perpendicularly to said first mentioned web at a position spaced from said bottom flange and interengageable with coacting rim portions on the panels to support the panels at positions spaced above said support member, said holding portion substantially filling the narrower dimension of the slot and being resilient in the direction of said narrower dimension.

4,193,248

VEHICLE PROTECTIVE SYSTEM

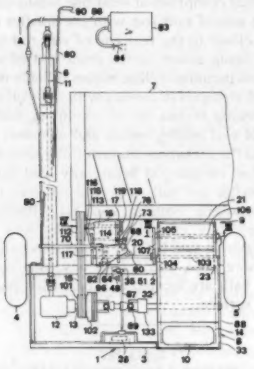
Joseph T. G. Gilleman, Sint-Denijs-Westrem, Belgium, assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Nov. 30, 1978, Ser. No. 965,009

Claims priority, application United Kingdom, Dec. 2, 1977, 50290/77; Jan. 5, 1978, 268/78

Int. Cl.[2] **A01D** *75/18*

U.S. Cl. 56—10.2 **9 Claims**



1. A harvesting machine comprising:

(a) a chassis,

(b) a crop processing means on the chassis for operating on crop material fed thereto,

(c) feeder means for feeding crop material to the crop processing means,

(d) a drive train for driving the feeder means,

(e) detector means associated with the feeder means for detecting undesirable objects passing through the feeder means towards the crop processing means,

(f) drive arresting means associated with the drive train of the feeder means, and

(g) drive train interrupting means adapted to interrupt the drive train to the feeder means independently of said arresting means,

(h) said detector means being operable upon detection of an undesirable object to cause the arresting means to initiate arrest of the drive to feeder means and to also cause said drive train interrupting means to interrupt the drive train simultaneously or preceding said arrest to reduce the load on the drive train during arrest.

4,193,249

HYDRAULIC DRIVE FOR LAWN CLIPPING VACUUM COLLECTOR

DeForest Tackett, Rte. 1 Box 192-A, Reddick, Fla. 32686

Filed May 16, 1978, Ser. No. 880,055

The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.

Int. Cl.[2] **A01D** *35/262*

U.S. Cl. 56—11.9 **6 Claims**

1. A hydraulic drive lawn clipping vacuum collector attachment for a tractor lawn mower driven by an internal combustion engine and incorporating a power takeoff, a driven grass cutting blade contained within a housing and a rear hitch mounting plate, comprising:

a refuse storage bin;

a mounting bracket affixed to said refuse storage bin and adapted to be rigidly secured to said tractor, said mounting bracket adapted to support said refuse storage bin suspended above ground levels;

a blower housing incorporated in said mounting bracket;

an impeller contained within said blower housing;

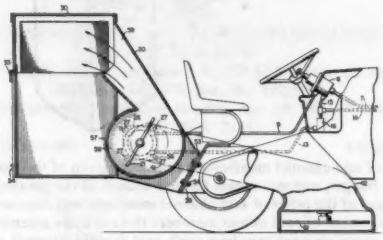
a duct coupling said lawn mower blade housing to said refuse storage bin;

a hydraulic pump driven by said power takeoff of said internal combustion engine, said hydraulic pump including a fluid inlet and fluid outlet;

a rotary hydraulic motor, including a fluid inlet and a fluid outlet;

said hydraulic motor incorporating a rotary shaft for supporting and driving said impeller;

said hydraulic motor supported by said blower housing;



a first hydraulic fluid transfer means for coupling hydraulic fluid from said hydraulic pump fluid outlet to said rotary hydraulic motor fluid inlet, said first hydraulic fluid transfer means includes a control valve means for regulating the volume of fluid flow from said hydraulic pump to said rotary hydraulic motor;

a second hydraulic fluid transfer means for coupling hydraulic fluid from said rotary hydraulic motor fluid outlet to said hydraulic pump fluid inlet, said second hydraulic fluid transfer means includes a hydraulic fluid reservoir including a hydraulic fluid outlet coupled to said hydraulic pump fluid inlet and an inlet coupled to said rotary hydraulic motor fluid outlet; and

said control valve includes bypass means to direct surplus hydraulic fluid from said first hydraulic fluid transfer means to said second hydraulic fluid transfer means and said second hydraulic fluid transfer means includes a one-way valve coupled to said rotary hydraulic motor fluid outlet to prevent surplus hydraulic fluid from said bypass means from entering said rotary hydraulic motor.

4,193,250

HEIGHT CONTROL FOR MULTI-ROW CROP HARVESTER

Norman J. Kessens, and Marvin L. Joray, both of Celina, Ohio, assignors to Paul Revere Corporation, Coldwater, Ohio

Filed Nov. 29, 1978, Ser. No. 964,705

Int. Cl.[2] **A01D** *67/00, 75/14*

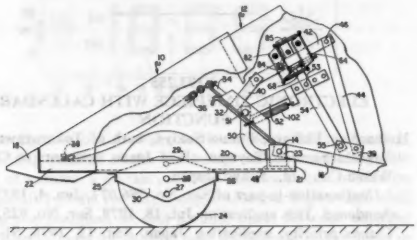
U.S. Cl. 56—208 **8 Claims**

1. Automatic height control apparatus for use in a multi-row crop harvester having a crop processing header transversely mounted across its forward facing end, the header having a multiplicity of spaced apart row dividers arrayed across the front thereof, the dividers each having a frame assembly, said frame assembly being pivotally mounted to the lower forward edge of the header frame, the mounting being such that the forward tips of the dividers are able to move up and down independent of the movement of the header, said apparatus comprising:

a ground engaging member mounted under the forward end of at least one of said dividers, said ground engaging member causing the leading edge of said member equipped divider to float up and down in response to changes in the terrain traversed by said crop harvester;

mechanical linkage for monitoring the angular relationship between said member equipped divider and said header, said linkage including a contactor bar having its one end pivotally attached to the frame of said header and its second end arranged to move in an arcuate path in direct proportion to the up and down motion of the forward tip of said divider;

a first electrode positioned to make contact with the second end of said contactor when the tip of said ground engaging member equipped divider is raised a prescribed amount with respect to the header, contact between said first electrode and said contactor bar being known as an up-command;



a second electrode positioned to make contact with the second end of said contactor bar when the tip of said member equipped divider is lowered a prescribed amount with respect to the header, contact between said second electrode and said contactor bar being known as a down-command; and

a servomechanism control system for elevational control of the crop processing header in response to the up-commands and the down-commands generated when said contactor bar makes, respectively, contact with either said first or said second electrode.

4,193,251

BALING DEVICE FOR AGRICULTURAL CROPS

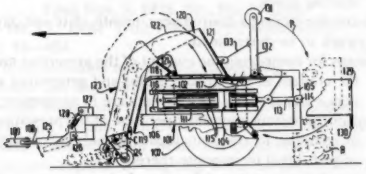
Pieter A. Oosterling, Nieuw-Vennep, and Adriaan van Zweeden, Rijsenhout, both of Netherlands, assignors to Expert N.V., Curaçao, Netherlands Antilles

Filed Nov. 4, 1977, Ser. No. 848,526

Claims priority, application Netherlands, Nov. 5, 1976, 7612345; May 13, 1977, 7705351

Int. Cl.[2] A01D *39/00*

U.S. Cl. 56—341 **4 Claims**



1. In a baling device, the combination of:

a mobile frame having supporting wheels;

a generally horizontal baling chamber on said frame having a movable end wall against which material is to be compressed;

a collection chamber disposed laterally of said baling chamber and having a discharge mouth communicating therewith in spaced relation to said end wall whereby said baling chamber defines a compression space beyond said discharge mouth toward said end wall;

a ram dimensioned to fill the cross section of the baling chamber and reciprocable therein between a retracted position clearing said discharge mouth on that side thereof remote from said end wall and in extended position beyond said discharge mouth and adjacent said end wall;

drive means connecting said ram with said end wall whereby said end wall is subjected to closing force when said ram is moved toward its extended position to compress material between said ram and said end wall;

means for continuously feeding material to be compressed into said collection chamber in response to movement of said frame over the ground;

a closure member normally blocking said discharge mouth; and

means for moving said closure member in concert with said ram whereby said closure member is moved from its normal, blocking position as said ram is moved toward its retracted position and is returned to its normal position as said ram is moved toward its extended position.

4,193,252

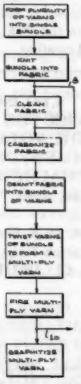
KNIT-DEKNIT METHOD OF HANDLING YARN TO PRODUCE CARBON OR GRAPHITE YARN

Gary D. Shepherd, Redondo Beach; Ramon B. Fernandez, Hawthorne; R. Glenn Kapaun, Huntington Beach, and Charles P. Logan, Hawthorne, all of Calif., assignors to Hitco, Irvine, Calif.

Filed Jun. 28, 1978, Ser. No. 919,850

Int. Cl.[2] D01F *9/12;* **D04B** *19/00;* **D02G** *1/00*

U.S. Cl. 57—351 **10 Claims**


FORM PLURALITY OF YARNS INTO SINGLE SHEDS
KNIT SINGLE INTO FABRIC
DEKNIT FABRIC INTO SINGLE OF YARNS
TWIST YARNS OF SINGLE TO FORM A MULTI-PLY YARN
FIRE MULTI-PLY YARN
GRAPHITIZE MULTI-PLY YARN

1. A method of making yarn which has been at least partially carbonized from a precursor yarn comprising the steps of:

forming the precursor yarn into a length of fabric;

taking the length of fabric through a carbonization process to convert the precursor yarn into a yarn of at least partly carbon composition; and

thereafter disassembling the fabric into the yarn which has been at least partially carbonized;

the yarn being comprised of a plurality of single ply yarns which are twisted together to form a multi-ply yarn as a separate step at some point in the method.

4,193,253

SPINNING POT

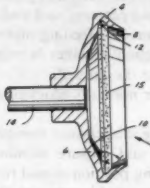
Werner Herbert, Markdorf; Wunibald Kunz, Friedrichshafen, and Klaus Pimiskern, Daisendorf, all of Fed. Rep. of Germany, assignors to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 959,895

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1977, 2750456

Int. Cl.[2] D01H *1/12*

U.S. Cl. 57—58.89 **6 Claims**



1. In a spinning arrangement, in combination:

(a) a spinning pot having an axis and formed with a cavity of circular crosssection about said axis,

(1) said pot having a bottom face transverse to said axis and axially bounding said cavity, and an axially extending, annular side face radially bounding an axially terminal part of said cavity open in a direction away from said bottom face,

(2) said side face flaring from said terminal part inward of said cavity,

(3) Respective axial portions of said bottom and side faces converging at an acute angle in a radially outward direction and defining a part of said cavity of greatest diameter; and

(b) a coating of a thermally hardened alloy of nickel and a nickel-phosphorus compound covering at least said portions of said faces and having a surface exposed in said cavity,

(c) a shaping disk is turned in the cavity of the pot in rolling engagement between the disk and the coating, producing a smoothing of said coating.

4,193,254

TENSIONING DEVICE FOR A DRIVE BELT FOR CONTROLLING THE ROTATION OF ALIGNED MEMBERS SUCH AS SPINDLES OF TEXTILE MACHINES

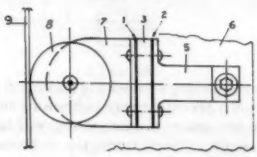
Goffredo Fusaroli, Milan, Italy, assignor to S.A.M.P.R.E. S.p.A., Italy

Filed Dec. 4, 1978, Ser. No. 966,160

Claims priority, application Italy, Dec. 6, 1977, 30504 A/77

Int. Cl.[2] D01H *1/24*

U.S. Cl. 57—105 **4 Claims**



1. A tensioning device for supporting a rotatable pressure roller in tangential engagement with a continuous drive belt running tangentially to a row of members aligned along a longitudinal axis of a machine, for instance spindles of a ring spinning machine or of a ring twisting machine or rotors of machines for open end spinning, for ensuring the adherence of the belt to the members to be driven in rotation, comprising

a flexible support formed by two identical tapes of hardened steel and by two identical spacers secured in spaced relation between the ends of said tapes to fix the tapes in spaced, parallel relation to each other,

a pressing roller rotatably mounted on one end of said support, and

means fixing the other end of the support to a machine, said tapes being flexible to permit said one end of the support to move relative to its other end in such a way that the axis of the pressing roller is displaceable with said one end of the support parallel to itself.

4,193,255

ELECTRONIC TIMEPIECE WITH CALENDAR FUNCTION

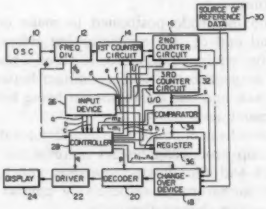
Heihachiro Ebihara; Fukuo Sekiya, both of Tokorozawa, and Takashi Yamada, Sayama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 756,677, Jan. 4, 1977, abandoned. This application Jul. 18, 1978, Ser. No. 925,714

Claims priority, application Japan, Jan. 12, 1976, 51-2614; Jun. 1, 1976, 51-63830

Int. Cl.[2] G04B *19/24*

U.S. Cl. 368—34 **15 Claims**



2. An electronic timepiece comprising:

means for generating a relatively high frequency signal;

means for dividing the relatively high frequency signal to provide a low frequency signal;

means for generating time information signals in response to the low frequency signal;

means for presetting reference data indicative of an existing leap year, year, month, date and day of the week and counting leap years, years, months, dates and days of the week at a high speed with the reference data serving as starting point;

means for storing a desired year, month, date and days of the week to be determined;

means for comparing the content of the presetting means and the content of the storing means and generating a coincidence signal when the contents are in agreement;

means for halting counting operation of the presetting means in response to the coincidence signal and generating an output signal in response thereto;

means for generating drive signals in response to the time information signals;

means for displaying time information in response to the drive signals; and

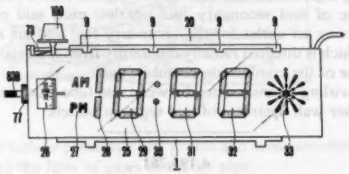
means for passing an output from the presetting means to the drive signal generating means in response to the output signal from the halting means to cause the content of the presetting means to be displayed by the display means.

4,193,256

DIGITAL CLOCKS PROVIDED WITH TIME SWITCH MECHANISMS

Kanji Tobeta, Tokyo, and Shuji Otsuka, Yonezawa, both of Japan, assignors to Tamura Electric Works, Ltd., Tokyo, Japan

Filed Feb. 3, 1978, Ser. No. 874,831
Claims priority, application Japan, Jun. 3, 1977, 52-72389[U]; Jun. 16, 1977, 52-70446; Jun. 30, 1977, 52-78544
Int. Cl.[2] G04B *23/00, 19/30*
U.S. Cl. 368—74 **9 Claims**



1. A digital clock provided with a time switch mechanism, comprising parallel shafts extending between opposing side walls of a frame, a plurality of digit display units mounted on said parallel shafts for displaying respective digits, digit shift means also mounted on said parallel shafts between adjacent digit display units for shifting time digits from lower digits to upper digits, a driving motor mounted on one side wall for driving at least significant digit display unit, a sub-plate confronting the other side walls, a time switch mechanism including a timer setting wheel rotatable to select a set time and having cam receiving means, a cam gear driven by said motor and having cam elements to engage said cam receiving means for predetermined rotative relation of said wheel and said cam gear, and a timer lever urging said cam gear toward said timer setting wheel and movable upon engagement of said cam elements with said cam receiving means, said mechanism located between said other side wall and said sub-plate, cam members secured to the opposite ends of a shaft for supporting said digit shift means, a buzzer operating member operated by the leakage flux of said driving motor, one of said cam members engaging said timer lever, and the other said cam member engaging said buzzer operating member for transmitting the motion of said timer lever to said buzzer operating member through said shaft for supporting said digit shift means to actuate said buzzer when said cam elements and said cam receiving means are engaged.

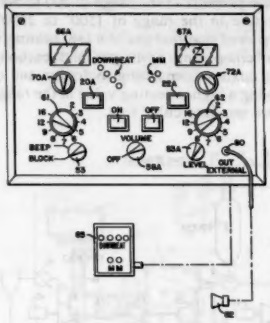
4,193,257

PROGRAMMABLE METRONOME

Paul F. Watkins, 5551 Montgomery Square Dr. #102, Kettering, Ohio 45440

Filed Nov. 9, 1978, Ser. No. 959,353
Int. Cl.[2] G04F *5/02;* **A63J** *17/00;* **G10B** *15/00*
U.S. Cl. 84—484 **6 Claims**

1. A programmable metronome comprising
a variable rate time pulse generator,
means for setting the rate of said time pulse generator,
audible and visible transducer means including separate visible transducers for beats and downbeats and a tone generator capable of emitting different sounds for beats and downbeats,
divider means receiving pulses from said time pulse generator,
selector means connected between said divider means and said transducer means and operable to pass different numbers of pulses per measure from said time pulse generator to said transducer means according to manual selection of desired beats/measure,
and a downbeat emphasis circuit having an input from said selector means and an output to said downbeat transducer



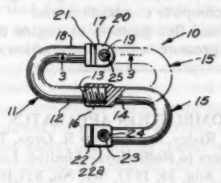
means to add emphasis to each downbeat in a measure of beats.

4,193,258

CHAIN SHACKLE

Adam F. Fasnacht, 19832 Alana Rd., Castro Valley, Calif. 94546

Filed Jul. 21, 1978, Ser. No. 926,885
Int. Cl.[2] F16G *15/02*
U.S. Cl. 59—86 **2 Claims**



1. A chain shackle, comprising a pair of "U"-shaped members, which are pivotal on each other, one of said members having tooth and clincher pin means, and the other of said members having tooth and opening means, for locking said chain shackle to a chain; one of said pair of "U"-shaped members being threaded on the outer periphery of one leg, and being rotatably received within a threaded end of the other of said pair of "U"-shaped members, which forms a pivotal joint, and said "U"-shaped member having said externally threaded end, being provided with a head on its opposite leg having said tooth and clincher pin means.

4,193,259

PROCESS FOR THE GENERATION OF POWER FROM CARBONACEOUS FUELS WITH MINIMAL ATMOSPHERIC POLLUTION

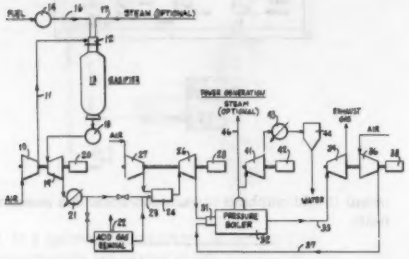
James R. Muenger, Beacon, and Everett M. Barber, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed May 24, 1979, Ser. No. 42,272
Int. Cl.[2] F02C *7/02;* **F02G** *3/00*
U.S. Cl. 60—39.04 **7 Claims**

6. In a process for the generation of power from a liquid or solid sulfur-containing fuel wherein said fuel is subjected to partial oxidation with air or oxygen at elevated pressure effecting conversion of said sulfur-containing fuel to a fuel gas stream having a higher heating value in the range of 60 to 350 Btu's per cubic foot and comprising carbon monoxide, hydrogen, methane and gaseous sulfur compounds, and said gaseous

sulfur compounds are removed from said fuel gas stream, the improvement which comprises:

(a) subjecting said fuel gas stream to partial oxidation with air at said pressure in the range of 300 to 500 psia and at a temperature in the range of 1500° to 2500° F. effecting conversion of said fuel gas to a low heating value gaseous mixture comprising hydrogen and carbon oxides, said gaseous mixture comprising hydrogen and carbon oxides and having a higher heating value in the range of 40 to 233 Btu's per standard cubic foot.



(b) expanding said low heating value gaseous mixture from (a) in an engine to a pressure in the range of 30 to 50 psia producing power,

(c) subjecting said low heating value gaseous mixture to substantially complete combustion with air at a pressure in the range of 30 to 50 psia producing flue gases comprising products of complete combustion, and

(d) expanding said flue gases in an engine to substantially atmospheric pressure with the production of power.

4,193,260

COMBUSTION APPARATUS

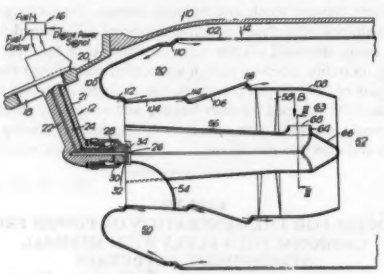
Denis R. Carlisle, Risley, and Andrew R. Grun, Tilehill, both of England, assignors to Rolls-Royce Limited, London, England

Filed Aug. 23, 1977, Ser. No. 827,108

Claims priority, application United Kingdom, Sep. 4, 1976, 36732/76

Int. Cl.[2] F02C *7/22*

U.S. Cl. 60—737 **2 Claims**



1. A combustion apparatus for a gas turbine engine comprising:

a combustion chamber having generally annular outer and inner walls joined at their upstream ends, said inner wall being of lesser length than the outer and said chamber having a primary upstream combustion zone located generally between said walls and a secondary combustion zone located generally downstream of said inner wall;

a fuel injector having a plurality of primary fuel nozzles and a plurality of secondary fuel nozzles;

a plurality of primary duct means arranged to receive fuel from respective ones of said primary fuel nozzles along with compressed air and to direct the resulting primary fuel and air mixture to said primary combustion zone;

a plurality of secondary duct means contained within said inner wall and arranged to receive fuel from respective ones of said secondary fuel nozzles along with compressed air and to direct the resulting secondary fuel and air mixture into said secondary combustion zone;

tube means extending from adjacent said secondary fuel nozzles to adjacent said secondary combustion zone and spaced from said inner wall, each of said plurality of secondary duct means comprising a longitudinally extending segment of said tube means aligned with a respective one of said secondary fuel nozzles, each said segment having an outlet for the secondary fuel and air mixture which is directed radially outwardly from the axial-center line of the combustion chamber; and

air swirling means located between said tube means and said inner wall upstream of said segment outlets.

4,193,261

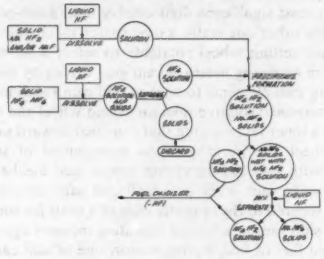
METHOD OF OXIDATION OF FUELS WITH TETRAFLUORAMMONIUM BIFLUORIDE

William D. English, Orange, Calif., assignor to TRW, Inc., Redondo Beach, Calif.

Filed Feb. 21, 1978, Ser. No. 879,636

Int. Cl.[2] C06D *5/08*

U.S. Cl. 60—218 **6 Claims**



1. A method for the generation of energy which comprises combining an oxidizable fuel with a solution of tetrafluorammonium bifluoride in anhydrous liquid hydrogen fluoride provided in an amount sufficient for hypergolic oxidization of said fuel, the tetrafluorammonium bifluoride content of the solution being up to about 50 mole percent, the balance of the solution being substantially anhydrous liquid hydrogen fluoride.

4,193,262

GAS TURBINE ENGINES

Leonard S. Snell, Bristol, England, assignor to Rolls-Royce Limited, GB2, United Kingdom

Filed Feb. 3, 1978, Ser. No. 874,758

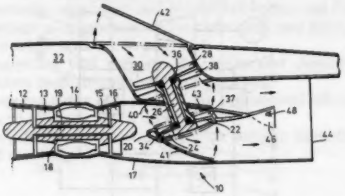
Claims priority, application United Kingdom, Feb. 24, 1977, 7953/77

Int. Cl.[2] F02K *3/10*

U.S. Cl. 60—261 **8 Claims**

1. A gas turbine engine power plant comprising a gas turbine engine terminating in an elongate jet pipe which extends along a longitudinal axis, an air duct constructed to receive air and direct it to mix with an efflux of gases from the engine, an auxiliary compressor located in the air duct, a free turbine for driving the auxiliary compressor located in the jet pipe, flow diverter means selectively operable to direct the efflux of gases from the engine as desired through either of two paths, one path being through the free turbine to drive it and thereby produce a flow of compressed air from the auxiliary compres-

sor, the other path circumventing the free turbine so that the free turbine is rendered inoperable independently of the engine, and a flow mixer means for mixing the air from the auxiliary compressor with the efflux of gases from the engine, the free turbine being mounted for rotation about an axis angled to the longitudinal axis of the jet pipe so that in its inoperative state, where the efflux of gases from the engine circumvents it,



the free turbine presents a low profile and minimizes the disturbance to the flow of gases in the jet pipe.

4. A gas turbine power plant as claimed in claim 1 in which the gas efflux and the compressed air are mixed by a plurality of mixer chutes arranged downstream of said free turbine.

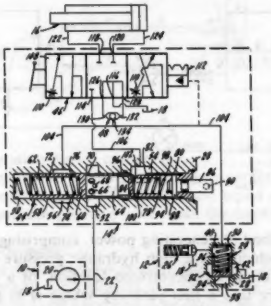
5. A gas turbine power plant as claimed in claim 4 in which a reheat gutter means is situated within or adjacent to the mixer chutes.

4,193,263

FLUID CONTROL SYSTEM WITH INDIVIDUALLY VARIABLE FLOW CONTROL MECHANISM FOR EACH CONTROL SECTION

David R. Ille, Wooster, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jul. 27, 1978, Ser. No. 928,649
Int. Cl.² F15B 11/16, 15/18
U.S. Cl. 60—420 **21 Claims**



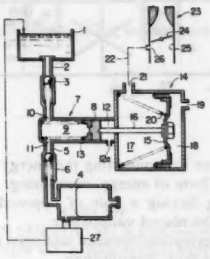
1. In a fluid system including fluid supply means, a fluid motor, and directional control valve means movable between a neutral position and a power position for controlling fluid flow from said fluid supply means to said fluid motor; the improvement comprising flow control means responsive to load pressure at said fluid motor for maintaining a constant rate of fluid flow from said fluid supply means to said fluid motor when said directional control valve means is in said power position, said flow control means being independently variable to determine said constant rate.

4,193,264

PRESSURED FLUID SUPPLY SYSTEM

Koichi Takahashi; Yoshikazu Hayakawa, and Keizaburo Usui, all of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jul. 15, 1977, Ser. No. 816,253
Claims priority, application Japan, Jul. 27, 1976, 51/89297
Int. Cl.² F15B 1/02
U.S. Cl. 60—397 **43 Claims**



1. A pressurized fluid supply system for a motor vehicle equipped with an internal combustion engine, said internal combustion engine having an induction manifold and a throttle valve operatively disposed thereon, comprising:

reservoir means containing unpressurized working fluid;

reciprocating pump means fluidly communicating with said reservoir means for receiving working fluid therefrom;

vacuum motor means operatively connected to said reciprocating pump means for inducing the reciprocating motion of first piston means reciprocatingly disposed in said reciprocating pump means, said vacuum motor means having second piston means reciprocatingly disposed therein so as to divide said vacuum motor sealingly into a vacuum chamber and an atmospheric chamber, said vacuum chamber being fluidly connected to the induction manifold of said engine downstream of said throttle valve; and

accumulator means fluidly connected to said reciprocating pump means for receiving pressurized fluid displaced therefrom thereinto;

control means interposed between said induction manifold and said vacuum motor for controlling the fluid communication therebetween, and pressure relief means fluidly connected between said reciprocating pump means and said accumulator means; said control means comprising:

an unstable multivibrator connected to a source of electromotive force through a main switch; and

electromagnetic valve means interposed in a conduit interconnecting the induction manifold downstream of said throttle valve and said vacuum chamber, said electromagnetic valve means being arranged to communicate the vacuum chamber with the atmosphere when in a first state of energization and communicate the vacuum chamber with the induction manifold when in a second state of energization;

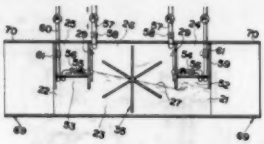
said unstable multivibrator being arranged to periodically take alternate first and second states, and said first state being one which induces said first state of energization in said electromagnetic valve means and said second state being one which induces said second state of energization in said electromagnetic valve means.

4,193,265

TRANSDUCER FOR CONVERTING THE ENERGY OF OCEAN CURRENTS

Fumio Ootsu, 6-4, Shirahae-cho, Sasebo-shi, Nagasaki-ken, Japan (857)

Filed Sep. 8, 1978, Ser. No. 940,606
Claims priority, application Japan, Apr. 18, 1978, 53/44791
Int. Cl.[2] F15B *11/06*
U.S. Cl. 60—398 **3 Claims**



1. A transducer for converting the energy of an ocean current to another form of energy, comprising:

(a) a housing having a pair of opposed open ends and adapted to be placed underwater;

(b) a channel extending between said open ends for allowing sea-water to flow therethrough;

(c) a plenum room disposed in said housing and overlying said channel, said plenum room being bottomed by the sea-water in said channel;

(d) an impeller including a drive shaft rotatably supported by said housing, said impeller being disposed partly in said plenum room and partly in said channel whereby said impeller can be rotated by the flow of sea-water through said channel;

(e) means operatively coupled with said drive shaft for producing energy in response to rotation of said impeller;

(f) a pair of air-trapping chambers disposed in said housing and located one on each side of and in communication with said plenum room, each of said chambers opening toward said channel whereby said chambers can receive any air that has escaped from said plenum room through said channel;

(g) an air reservoir communicating with said plenum room; and

(h) means for controlling the commnication between said plenum room and said chambers and between said air reservoir and said plenum room when the sea-water at the bottom of said plenum room reaches a predetermined level.

4,193,266

GAS TURBINE POWER PLANT

Hansulrich Frutschi, Riniken, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Jul. 19, 1978, Ser. No. 926,199
Claims priority, application Switzerland, Jul. 28, 1977, 9326/77
Int. Cl.[2] F02C *1/04*
U.S. Cl. 60—644 **18 Claims**

1. A power plant, comprising:

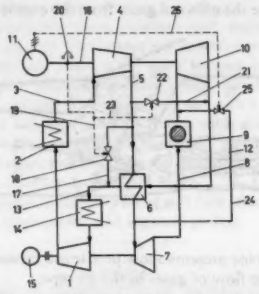
compressor means for compressing a working fluid, the compressor means having a relatively high pressure compressor section and a relatively low pressure compressor section;

turbine means for expanding the working fluid, the turbine means having a relatively high pressure turbine section and a relatively low pressure turbine section;

heating means for supplying heat to the working fluid;

circulation means for supplying the working fluid in a closed path among the compressor means, the turbine means and the heating means, the circulation means supplying the working fluid from the high pressure section of the turbine means to the heating means and then to the low-pressure section of the turbine means;

first shaft means for operatively connecting together the high pressure compressor section and the low pressure turbine section;



second shaft means for cooperatively connecting together the low pressure compressor section and the high pressure turbine section; and

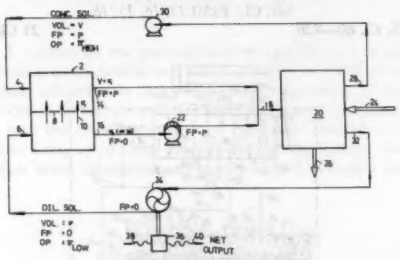
control means for maintaining the pressure of the working gas substantially constant between the high and low pressure turbine sections and within the heating means.

4,193,267

METHOD AND APPARATUS FOR GENERATING POWER UTILIZING PRESSURE-RETARDED OSMOSIS

Sidney Loeb, Warrenton, Va., assignor to Ben-Gurion University of the Negev Research & Development Authority, Beer-sheba, Israel

Filed Feb. 15, 1978, Ser. No. 877,989
Claims priority, application Israel, Feb. 25, 1977, 51541
Int. Cl.[2] F01K *25/06*
U.S. Cl. 60—649 **15 Claims**



1. A method of generating power, comprising:

(A) introducing at a high hydraulic pressure a first liquid, constituting a concentrated solution, of a high osmotic pressure into a first pathway which is at least partially defined by one face of a semi-permeable membrane;

(B) introducing at a lower hydraulic pressure a second liquid, constituting a dilute solution, of a lower osmotic pressure into a second pathway which is at least partially defined by the opposite face of the semi-permeable membrane;

(C) maintaining the hydraulic pressures of the liquids on the opposite faces of the membrane at a pressure difference which is less than the osmotic pressure difference between the liquids, to effect, by Pressure-Retarded-Osmosis, the passage of a part of the solvent of the dilute solution through the semi-permeable membrane, forming a pres-

surized mixed solution of greater volume than said concentrated solution introduced into said first pathway;

(D) and converting the potential energy stored in the pressurized mixed solution to useful energy by:

(i) pressurizing a quantity of liquid taken as a flushing solution from the second pathway at a point downstream of the semi-permeable membrane and adding same to the pressurized mixed solution;

(ii) thermally separating said pressurized mixed and flushing solutions to regenerate said concentrated and dilute solutions while both are pressurized;

(iii) recycling said pressurized, regenerated concentrated solution back through said first pathway;

(iv) depressurizing said pressurized, regenerated dilute solution to produce useful energy; and

(v) recycling the depressurized dilute solution back through said second pathway.

4,193,268

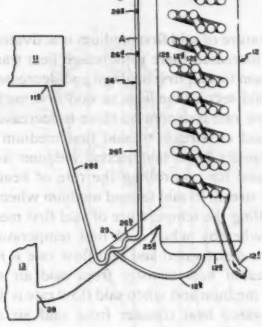
EVAPORATION DEVICE AND METHOD WITH CONTROLLED REFRIGERANT EXPANSION AND STORAGE

Benjamin A. Phillips, Benton Harbor, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 796,773, May 13, 1977, Pat. No. 4,127,010. This application Nov. 21, 1978, Ser. No. 962,838

Int. Cl.² F25B *15/00, 37/00*

U.S. Cl. 62—101 **17 Claims**



1. An evaporation device comprising:

expansion means for receiving liquid refrigerant at a condenser pressure and for expanding said liquid refrigerant to an evaporator pressure lower than the condenser pressure;

an insulated housing;

a coil within said insulated housing having an inlet and an outlet through said housing for conducting within the interior of said coil a material to be cooled by the evaporation of liquid refrigerant;

separation means for receiving refrigerant from said expansion means and for separating liquid refrigerant from gaseous refrigerant therein and for directing said liquid refrigerant over said coil in heat exchange relation with the interior of said coil;

means for flowing refrigerant as a thin film over the outside surface of said coil;

gas outlet means for receiving gaseous refrigerant from said separation means and from over said coil and for conducting gaseous refrigerant out of said insulated housing; and

storage means beneath said coil for collecting liquid refrigerant not evaporated by passage over said coil within said housing.

11. A method of evaporating a refrigerant comprising the steps:

expanding liquid refrigerant from a condenser pressure to an evaporator pressure lower than said condenser pressure;

separating gaseous refrigerant from the liquid refrigerant;

directing liquid refrigerant over and in heat exchange relation with a coil containing material to be cooled, whereby liquid may evaporate by withdrawing heat of evaporation from the material to be cooled to form gaseous refrigerant;

receiving and storing unevaporated liquid refrigerant beneath the coil; and

withdrawing gaseous refrigerant from adjacent the coil.

4,193,269

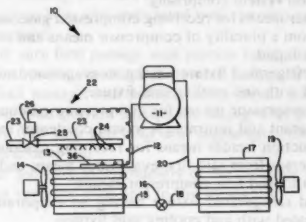
APPARATUS FOR SUPPLYING A COOLING LIQUID TO A CONDENSER OF A REFRIGERATION UNIT

Vincent T. Barry, Camillus, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 14, 1978, Ser. No. 933,339

Int. Cl.² F25B *39/04*

U.S. Cl. 62—171 **4 Claims**



1. Apparatus for supplying a cooling fluid to a condenser of a refrigeration unit comprising:

a conduit for passing the cooling fluid from a source thereof into heat transfer relation with the condenser;

a valve to regulate the flow of fluid through the conduit and having an open position allowing fluid flow therethrough; and

an electronic control for use with a source of an alternating electric current, and including

a triac having an open state for preventing the current from passing therethrough, a closed state for conducting the current through the triac, and a trigger wherein, when a current having a predetermined magnitude passes thereto, the triac changes from the open state to the closed state,

electrically actuated means positioned in series with the triac for moving the valve to the open position, and

a temperature responsive resistance element in heat transfer relation with a refrigerant passing through the condenser and positioned in series with the trigger of the triac for varying the magnitude of the current passing to the trigger in response to the temperature of the refrigerant passing through the condenser for changing the triac from the open state to the closed state when the temperature of the refrigerant passing through the condenser reaches a predetermined magnitude, and

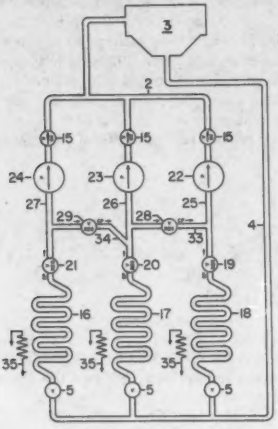
means for shifting the phase of the current passing to the trigger of the triac.

4,193,270

REFRIGERATION SYSTEM WITH COMPRESSOR LOAD TRANSFER MEANS

Jack D. Scott, 486 Madrona St., Twin Falls, Id. 83301

Filed Feb. 27, 1978, Ser. No. 881,415
Int. Cl.[2] F25B *7/00*
U.S. Cl. 62—175 **11 Claims**



1. A closed cycle, multiple compressor, multiple evaporator, refrigeration system comprising:

condenser means for receiving compressed gaseous refrigerant from a plurality of compressor means and condensing it to a liquid;

a first refrigerated fixture having an evaporator means associated with and cooling said fixture;

a first compressor means for compressing gaseous effluent refrigerant and returning it to said condenser means;

a first suction header means for receiving gaseous effluent refrigerant from said first evaporator means and transferring it to said first compressor means;

a second refrigerated fixture having an evaporator means associated with and cooling said fixture;

said second evaporator means operating at a higher pressure than said first evaporator means;

a second compressor means for compressing gaseous effluent refrigerant and returning it to said condenser means;

a second suction header means for receiving gaseous effluent refrigerant from said second evaporator means at a pressure higher than the pressure in the first suction header means and transferring it to said second compressor means;

means for transferring gaseous effluent refrigerant from said second suction header means to the first suction header means to maintain a minimum amount of gaseous effluent refrigerant flow to said first compressor means;

supply header means for supplying compressed liquid refrigerant from said condenser means to said first and second evaporator means.

4,193,271

AIR CONDITIONING SYSTEM HAVING CONTROLLABLY COUPLED THERMAL STORAGE CAPABILITY

Richard F. Honigsbaum, 21 A Barry Gardens, Passaic, N.J. 07055

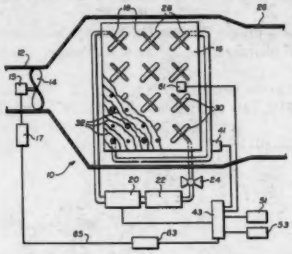
Filed Jul. 7, 1977, Ser. No. 813,471
Int. Cl.[2] F25D *17/00*; **B60H** *3/04*
U.S. Cl. 62—180 **34 Claims**

1. In a system for conditioning a stream of air to provide an output air stream having a controlled temperature, said system being of the type comprising means for producing an air stream, a first medium in heat exchange relation with said air stream and means for controlling the temperature of said medium to effect sufficient heat exchange between said medium and said air stream to maintain the temperature of said output air stream at said controlled temperature, the improvement in said system comprising:

a second medium having thermal storage capability;

thermal conducting means interposed between said first and second media for effecting heat exchange therebetween, at least a portion of said thermal conducting means being disposed in the path of said air stream for heat exchange therewith, said portion being arranged to permit passage of said stream therethrough;

means for controlling the flow rate of said air stream through said thermal conducting means portion for controllably apportioning heat transfer from said air stream and said second medium to said first medium when said means for controlling the temperature of said first medium is activated whereby when said means for controlling the



temperature of said first medium is activated and said flow rate is increased there is increased heat transfer from said air stream to said first medium and decreased heat transfer from said second medium to said first medium and when said flow rate is decreased there is decreased heat transfer from said air stream to said first medium and increased heat transfer from said second medium to said first medium; and for controlling the rate of heat transfer from said air stream to said second medium when said means for controlling the temperature of said first medium is deactivated whereby when said first temperature controlling means is deactivated and said flow rate is increased there is increased heat transfer from said air stream to said second medium and when said flow rate is decreased there is decreased heat transfer from said air stream to said second medium; and

cycling means operatively connected to said first medium temperature controlling means for effecting activation and deactivation thereof.

4,193,272

PORTION CONTROLLED FROZEN FOOD

Vincent E. Bernard, 422 Brook Glen, Richardson, Tex. 75080

Division of Ser. No. 633,481, Nov. 19, 1975, Pat. No. 4,060,998, which is a continuation-in-part of Ser. No. 526,146, Nov. 22, 1974, abandoned. This application Sep. 12, 1977, Ser. No. 832,194
Int. Cl.[2] F25C *5/02*
U.S. Cl. 62—320 **4 Claims**

2. A system for forming a plurality of discrete products having preselected volumes and weights comprising:

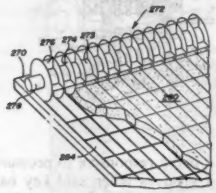
means for receiving a quantity of semi-fluid material,

a pump for pumping said material at a selected rate,

an extruder associated with said pump and having an inlet to receive said pumped material and having an outlet for outputting said pumped material,

conduits connected to said outlet for conveying a continuous sheet of said material,

a chilling station located at the remote end of said conduit for receiving said continuous sheet of said material and for chilling said continuous sheet to an extent that said sheet maintains its extruded cross-section, and



a rotatable drum having equally spaced sharpened circumferential ribs for slicing said sheet into continuous lengths and sharpened longitudinal ribs for severing said lengths to form discrete predetermined shapes from said mixture, said linear conveyor including indentions for receiving the sharpened edges of said circumferential and longitudinal ribs to facilitate cutting of said continuous sheet.

4,193,273

APPARATUS FOR USE IN PRODUCING KNIT FABRICS

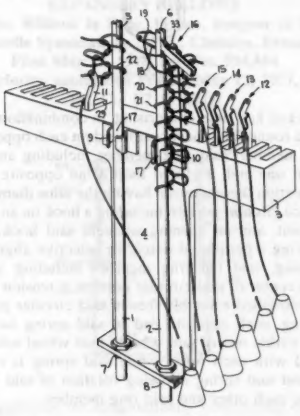
Walter Palange, 655 Park Shore Dr., Naples, Fla. 33940

Filed Mar. 15, 1978, Ser. No. 886,776

Claims priority, application Italy, Jun. 28, 1977, 16905 A/77; Oct. 21, 1977, 51513 A/77

Int. Cl.² D04B *3/00*

U.S. Cl. 66—4 **4 Claims**



1. Apparatus for use in producing knit fabrics comprising a base member, at least two elongate upright knitting supports on said base member, means defining a slot in each support extending longitudinally from a free upper end thereof and at least one needle for use, when threaded with yarn from a yarn supply, in forming stitches on the supports, said needle comprising a curved forward end terminating in a tip, a first yarn-threading eye located substantially in the region of said tip and a second yarn-threading eye spaced rearwardly along the needle from said first eye, wherein said supports consist of a pair of rods, said base member comprising an upper section and a lower section depending from said upper section, a pair of collets mounted on said upper section, said collets loosely receiving said rods and being provided with openings allowing sliding movement of knit material along said rods, and means attaching said rods to said lower section at ends of said rods remote from said slots.

4,193,274

YARN FEED AND CHANGE MECHANISMS

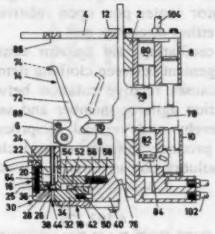
Daniel W. F. Gostelow, Leicester, England, assignor to Wildt Mellor Bromley Limited, Leicester, England

Filed Mar. 6, 1979, Ser. No. 17,901

Claims priority, application United Kingdom, Mar. 17, 1978, 10611/78

Int. Cl.² D04B *15/54*

U.S. Cl. 66—140 R **5 Claims**



1. Striper for knitting machine including:

a plurality of yarn feed passages; pneumatic means for providing a flow of fluid through the passages to thereby propel a leading yarn end towards knitting needles of the knitting machine; and, associated with the respective yarn feed passages;

a movable yarn feed passage wall portion for the respective yarn feed passage and a wall portion facing the movable yarn feed passage wall portion; drive means for moving movable wall portion against the facing wall portion to thereby trap yarn and hold it in alignment with the passage direction; and

a member movable independently of the movable wall portion for severing yarn held in the passage.

4,193,275

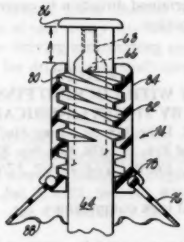
AGITATOR MECHANISM FOR CLOTHES WASHING MACHINE

John Bochan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 4, 1978, Ser. No. 965,803

Int. Cl.² D06F *17/06, 17/10*

U.S. Cl. 68—134 **10 Claims**



1. A washing machine comprising:

a clothes washing receptacle mounted in an upright position;

means for introducing a washing solution into said clothes washing receptacle;

an agitator mechanism including:

an agitator center post extending upwardly into the interior of said clothes receiving receptacle;

a vertical reciprocation agitator member;

means mounting said vertical reciprocation agitator member so as to be freely rotatable relative to said agitator center post, said vertical reciprocation agitator member including an agitator element extending radially outwardly from said agitator center post;

said means mounting said vertical reciprocation agitator member on said agitator center post including interengaging cam surfaces fixed to said agitator center post and said vertical reciprocation agitator member, respectively, causing relative axial movement in either direction between said vertical reciprocation agitator member and said agitator center post upon relative rotation therebetween in either direction; and

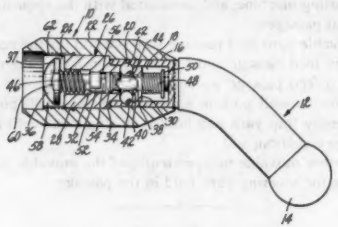
means for oscillating said agitator center post, whereby interengagement between clothing items and said agitator element causes relative rotation between said vertical reciprocation agitator member and said agitator center post, whereby said vertical reciprocation thereof will occur to produce agitation of said clothes load in said washing solution to carry out said washing action.

4,193,276

LOCK FOR RAILROAD SWITCH

George A. Lunuberg, Kinnelon, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed Sep. 13, 1978, Ser. No. 941,913
Int. Cl.[2] E05B *67/36*
U.S. Cl. 70—34 **5 Claims**



1. A lock assembly for releasably engaging a shackle end, comprising a housing having locking means at one end for engaging a shackle end and lock operating means comprising an elongated shaft rotatable between a locking orientation and an unlocking orientation, means retaining said shaft in the unlocking orientation and means biasing said shaft to the locking orientation, and means responsive to axial movement of the shaft in a predetermined direction to cause said shaft to rotate to the locking position.

4,193,277

LOCK BODY WITH LOCKING PINS OPENED OR CLOSED BY THE CYLINDRICAL KEY BAR

Jiuan P. Lo, 30-1, Lane 325, St., Tong Ho,Taipei City, Taiwan

Filed Feb. 8, 1978, Ser. No. 876,043
Int. Cl.[2] E05B *15/14, 19/02, 27/06, 27/10*
U.S. Cl. 70—358 **9 Claims**

1. A cylindrical lock comprising:

a housing;

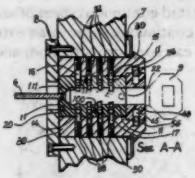
a cylindrical plug mounted for rotation in said housing;

a roll-back mounted for rotation with said plug;

tumbler means disposed in said plug for opening and closing said lock;

cylindrical key bar means for aligning said tumbler means at the periphery of said plug;

said bar means including a cylindrical bar having angled grooves in the periphery thereof corresponding to said tumbler means;



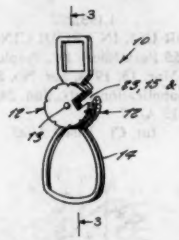
said tumbler means being responsive to pressure applied by the sides of said grooves when said key bar means are rotated in said plug to rotate said plug and said rollback.

4,193,278

LOCKED KEY RING

Jorge M. Martinez, 2857 Burt St., Las Vegas, Nev. 89101

Filed May 8, 1978, Ser. No. 903,940
Int. Cl.[2] A44B *15/00*
U.S. Cl. 70—459 **1 Claim**



1. A locked key ring, comprising, in combination, a flat ring member, a round flat wheel positioned on each opposite side of said ring member; said ring member including an open ring element at one end, a closed loop at an opposite end and a circular portion therebetween having the same diameter as said wheels, said circular portion including a hook on an end of said ring element, and an opening adjacent said hook, each said wheel having a peripheral notch for selective alignment with said opening, said flat ring member including an opening through a center of said circular portion, a tension coil spring directly journalled rotatably free in said circular portion central opening, each opposite end of said spring being rigidly anchored within one of said wheels, said wheel notches being misaligned with each other when said spring is rotationally relaxed, and said spring allowing rotation of said wheels respective to each other and said ring member.

4,193,279

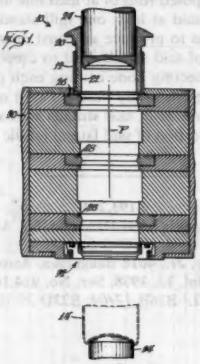
CUP HOLDER ASSEMBLY

Edward G. Maeder, Minnetonka, Minn., assignor to National Can Corporation, Chicago, Ill.

Filed Apr. 26, 1978, Ser. No. 900,269
Int. Cl.[2] B21D *22/00*
U.S. Cl. 72—44 **14 Claims**

1. In a drawing and ironing machine including a fixed frame, a ring carried by said fixed frame and having a first circular opening therein, a punch movable axially of said first circular opening, a cup holder sleeve interposed between said punch and said ring, said cup holder sleeve having an axial bore for receiving said punch, and a support for said cup holder sleeve, the improvement of said support including a first member having a second circular opening therein aligned with said first

circular opening and having a circumferential recess extending from the periphery thereof, a movable support element having a peripheral portion received in said recess and cooperating with one end of said cup holder sleeve, said support element having a circular aperture and being movable radially of said



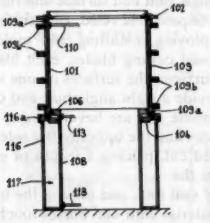
second circular opening, and biasing means between said first member and said support element normally maintaining said support element centered with respect to said second circular opening and accommodating radial movement of said one end of said cup holder sleeve and said support element in said openings.

4,193,280

APPARATUS FOR THE MANUFACTURE OF EXPANSION BELLOWS

Paul Mazier, Rillieux la Pape, France, assignor to Souplesse Fonctionnelle Systematique S.F.Z., Chassieu, France

Filed May 10, 1978, Ser. No. 904,414
Claims priority, application France, May 13, 1977, 77 16030
Int. Cl.[2] B21D *15/06*
U.S. Cl. 72—59 **6 Claims**



1. An apparatus for longitudinally contracting deformable sleeves by the hydroforming process to manufacture expansion bellows for pipelines and the like, said apparatus comprising:

a movable rigid sleeve having an inwardly turned lower portion and being positionable inside a deformable sleeve to be contracted;

means cooperating with said rigid sleeve and the deformable sleeve for defining a hydroforming circuit between the outer surface of said rigid sleeve and the inner surface of the deformable sleeve to be contracted; and

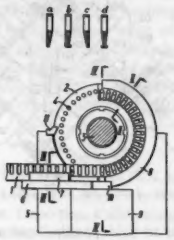
means positioned inside said rigid sleeve for defining an actuating circuit separate from said hydroforming circuit, the actuating circuit being adapted to cooperate with interior portions of said rigid sleeve to longitudinally move said rigid sleeve from a first position in which a first predetermined portion of said rigid sleeve is encompassed by said deformable sleeve to a second position in which a portion less than the first predetermined portion is encompassed by said deformable sleeve, movement of said rigid sleeve from said first to said second position longitudinally contracting the deformable sleeve.

4,193,281

DEVICE FOR MANUFACTURING COILED MAGNETIC CORES FOR ELECTRICAL MACHINES

Valery A. Kulikov, ulitsa Bobkova 8, kv. 2; Ernst A. Stepanian, Suzdalsky prospekt 7, kv. 41, and Emilen A. Stepaniants, ulitsa Zelenaya 4, kv. 6, all of Vladimir, U.S.S.R.

Filed Apr. 24, 1978, Ser. No. 899,592
Int. Cl.[2] B21D *11/06, 11/08;* **H02K** *15/00*
U.S. Cl. 72—130 **6 Claims**



1. A device for manufacturing coiled magnetic cores for electrical machines by bending a continuous band edgewise into a coil and wherein said band is provided with recesses, comprising a bed; means for tensioning said band mounted on said bed; a straight guide and an arched guide for said band mounted on said bed; a shaping element interposed between said guides; a rotary disc, mounted on a shaft and having an end face or side surface, received in a recess provided in said bed, a portion of the end face of said rotary disc facing said arched guide; said shaping element being a die having a wedge-shaped head with a working edge to produce a maximum elongation of said band at one edge forming the outer diameter of said coil; said working edge of said head extending radially and at an angle to said side surface of said rotary disc for forming a coil of a preset shape having at least one angled side surface formed by a series of elementary portions in the zone of the edge with maximum elongation alternate with portions preserving the original thickness of said band; uniformly spaced fingers mounted on said rotary disc and equal to the number of recesses in a single complete stator turn of said electrical machine; a cam secured to said bed for setting said fingers in reciprocating motion; for engagement with said band recesses two guide channels; for said band the first of said guide channels being straight and formed by said bed and said straight guide; the second guide channel being arched and formed by a portion of said rotary disc and said arched guide; and drive means for driving said shaping member in reciprocating motion, and for driving said shaft carrying said disc.

4,193,282

ROLLING MACHINE

Alexander I. Wilson, Sheffield, England, assignor to Hill Engineering Company Limited, Sheffield, England

Filed Jul. 3, 1978, Ser. No. 921,766
Int. Cl.[2] B21B *13/20*
U.S. Cl. 72—194 **21 Claims**

1. A rolling machine for reducing the cross-sectional dimensions of an elongate workpiece movable lengthwise along a passline, the machine comprising:

(a) a first pair of cooperating rolls between which said workpiece is to be intermittently reduced in a first reduction direction and each of which has a roll axis;

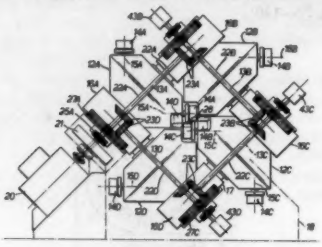
(b) a second pair of cooperating rolls between which said

workpiece is intermittently reduced in a second reduction direction transverse to said first direction and each of which has a roll axis;

(c) each said roll having a first rolling face extending substantially parallel to said roll axis and a second rolling face transverse to said roll axis and merging smoothly with said first rolling face;

(d) for each said roll of said first and second pairs, a carrier in which said roll is journalled for rotation about its said roll axis and which is mounted for rotation about a carrier axis inclined to said roll axis,

(e) the carrier axes of said carriers for said first pair of rolls



being transverse to said passline and on opposite sides thereof;

(f) the carrier axes of said carriers for said second pairs of rolls being transverse both to said passline and to said carrier axes of said carriers for said first pair of rolls and lying on oppsite sides of said passline; and

(g) means for synchronously driving all said carriers about said carrier axes;

(h) whereby in each cycle said rolls of each said pair of rolls approach and recede from said passline and each other as said rolls move in the direction of said passline, and said workpiece is intermittently contacted and reduced by said pairs of rolls alternately.

4,193,283

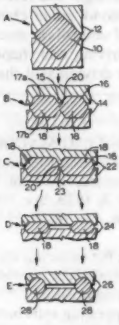
METHOD OF SLITTING A DOUBLE OR TRIPLE STRANDED BAR

Raymond E. Bowman, Oshawa, Canada, and Anthony Greaves, Belting, England, assignors to Co-Steel International Limited, Whitby, Canada

Continuation-in-part of Ser. No. 764,699, Feb. 1, 1977, abandoned, which is a continuation-in-part of Ser. No. 656,178, Feb. 9, 1976, abandoned. This application Aug. 21, 1978, Ser. No. 935,499

Int. Cl.[2] **B71B** *1/00*

U.S. Cl. 72—204 **3 Claims**



1. In the production of elongated metal bars from billets in which the billet is passed between the opposed rolls of successive mill stands whereby a compressive working force is applied to the billet, a method of slitting a multi-stranded bar of no more than three strands wherein each strand is interconnected to the adjacent strand at a continuous node of less thickness than said strands, comprising the step of passing the bar through the opposed rolls of at least one mill stand, applying to said bar in said at least one mill stand a compressive working force so as to produce an equal cross-sectional area reduction in each of said strands and to create lateral tensile forces in each connecting node causing each of said nodes to rupture and causing a laterally outward shift of the centres of gravity of the outermost of said strands substantially simultaneously with the creation of said lateral tensile forces, thereby separating adjacent strands.

4,193,284

CAME CÜTTING AND MOLDING TOOL AND METHOD OF USING SAME

Nathan O. McCrary, Jr., 4018 Baughman, Ames, Iowa 50010

Filed Jul. 13, 1978, Ser. No. 924,167

Int. Cl.[2] **B26B** *17/04;* **B23D** *29/02*

U.S. Cl. 72—325 **5 Claims**

1. A method of molding came for glazing for cut glass pieces, by cutting a length of came into two pieces, one piece having a right-angle butt end surface and the other piece having oppositely disposed beveled end surfaces said method comprising, employing a cutting and molding tool having oppositely disposed cutting blades, each blade having oppositely disposed surfaces, the surfaces on one side of said blades being flat to provide a right angle butt end cut while the surfaces on the opposite side are beveled away from the cutting edges of the blades and the opposite flat side of said blades to provide a beveled cut, placing a length of came material between and across the

open blades of said tool, and closing the blades of said tool onto said material until said blades touch the flat surfaces on said one side of said blades producing by cutting a piece of came having a right-angle butt end surface and the beveled surfaces of said other side of said blades producing by molding a piece of came having a pair of beveled end surfaces which together form a V-shaped end.

4,193,285

METHOD OF DEEP-DRAWING OF A CONTAINER OR THE LIKE FROM AN ALUMINIUM MATERIAL

Horst Zumsteg, Rorschacherberg, Switzerland, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Jun. 12, 1978, Ser. No. 914,964

Claims priority, application Switzerland, Jun. 15, 1977, 7379/77

Int. Cl.[2] **B21D** *22/00*

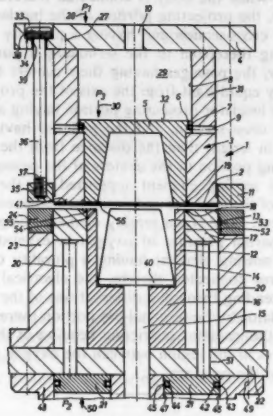
U.S. Cl. 72—348 **5 Claims**

1. A method of producing a container or the like having the shape of a truncated cone and a rolled-in edge portion by

deep-drawing a flat blank of sheet-like aluminium metal, including the steps of

(a) deep-drawing the sheet-like blank by a first draw into a cylindrical container blank and

(b) further drawing said blank by a counter draw into its final shape in the form of a truncated cone, such that the



positions of the inner and outer surfaces of the container blank remain unchanged,

wherein the improvement comprises

(c) initiating the counter draw prior to the completion of the first draw,

(d) the velocity of said counter draw exceeding the velocity of the first draw.

4,193,286

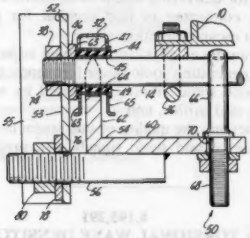
VEHICLE CONTROL ARM SPREADER TOOL

Moises R. Garcia, Dona Ana, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 18, 1978, Ser. No. 906,904

Int. Cl.[2] B21D *1/12*

U.S. Cl. 72—462 **3 Claims**



1. In association with a vehicle suspension that includes a fixed pivot shaft extending through bushings carried within U-cross sectioned end portions of a stamped metal control arm: the improvement comprising a tool installable on the pivot shaft for straightening a bent flange on a U-cross sectioned portion of the control arm; said tool comprising a first presser element **(48)** having a shaft-engageable hanger component **(50)** connected thereto for operatively locating said first presser element against one surface of the bent flange, a threaded stud **(56)** non-rotatably secured to said first presser element for disposition generally parallel to the control arm pivot shaft when the presser element is in its operative location, a second presser element **(52)** having a first opening therethrough for its mounting on an end of the pivot shaft, said second presser element having a second opening therethrough for loosely encircling an end of the aforementioned threaded stud, a first nut **(38)** threadable onto the pivot shaft, said nut being rotatable on said pivot shaft to thereby rigidly secure the second presser element to said shaft; and a second nut threadable onto the end of the stud that projects through the second opening, whereby the first presser element is forcibly drawn toward the second presser element to exert a straightening force on the bent flange, said first presser element comprising an angle member **(54)** having a first wall adapted to extend parallel to the pivot shaft, and a second upstanding wall adapted to extend into the U-shaped cross section of the metal control arm; said upstanding wall having a semi-circular notch in its upper edge for partial encirclement of the bushing carried within the control arm; the extreme upper edge of the upstanding wall being sharpened to a chisel character, whereby the first presser element can be forced into operative engagement with the bent flange on the control arm even though the U-cross sectioned end portion of the control arm is partially closed.

4,193,287

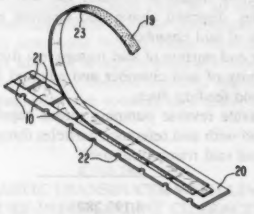
TECHNIQUE FOR APPLYING POLARIZER MATERIAL TO LIQUID-CRYSTAL DISPLAYS

James W. Pfeiffer, Cupertino, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Mar. 30, 1978, Ser. No. 891,589

Int. Cl.[2] H01S *4/00*

U.S. Cl. 29—593 **7 Claims**



1. A method of fabricated liquid-crystal displays (LCD's) including applying polarizer material to partially-finished LCD's, which comprises the following steps:

loading a plurality of partially-finished LCD's on a strip carrier such that the LCD's lie approximately in the plane of the strip carrier;

applying adhesive polarizer material in strip form over the partially-finished LCD's on at least one side of the strip carrier; and

cutting the polarizer material to desired size with non-contact cutting means.

4,193,288

APPARATUS FOR CALIBRATING INSTRUMENTS FOR GRANULOMETRIC RECORDING

Viktor A. Berber, ulitsa Shelkovichnaya, 184, kv. 65; Evgeny S. Pervushin, ulitsa Shelkovichnaya, 182, kv. 71; Khafiz M. Murtazin, 6 Internatsionalny proezd, 20; Vladimir G. Kholin, ulitsa Shelkovichnaya, 184, kv. 53, and Boris M. Galishnikov, ulitsa Shelkovichnaya, 190, kv. 27, all of Saratov, U.S.S.R.

Filed Aug. 21, 1978, Ser. No. 935,502

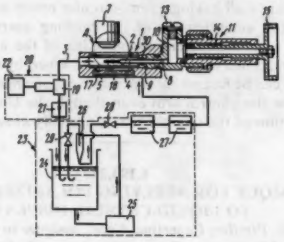
Int. Cl.[2] G01N *15/00*

U.S. Cl. 73—1 R **2 Claims**

1. An apparatus for producing a fluid flow containing reference particles of a given size, adapted to calibrate instruments for granulometric recording of particles in fluids and comprising:

a chamber;

an inlet port of said chamber;
an outlet duct of said chamber adapted to communicate with the inlet of the instrument being calibrated;
a means to pump uncontaminated fluid through said chamber;
a feeding duct to feed said chamber with said reference particles;
at least one chamber portion of said chamber, located near said outlet duct and implemented as a horizontally positioned transparent cylinder;
a transparent duct disposed within said transparent cylinder coaxially therewith;



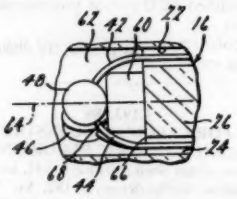
one end portion of said transparent duct tapering to a diametrical size which is commensurate with the maximum diameter of said reference particles;
an inspection means to monitor the size of said reference particles, disposed above said tapering end portion and outside of said chamber;
the other end portion of said transparent duct, isolated from the cavity of said chamber and adapted to communicate with said feeding duct;
an adjustable reverse pumping means capable of pumping the fluid with said reference particles through said feeding duct and said transparent duct.

4,193,289

CERAMIC INSULATOR FOR AN EXHAUST GAS OXYGEN SENSOR

Jerry L. Springer; Charles M. Wells, both of Livonia, and Wells L. Green, Garden City, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 22, 1979, Ser. No. 5,421
Int. Cl.[2] G01N 7/02
U.S. Cl. 73—27 R **4 Claims**



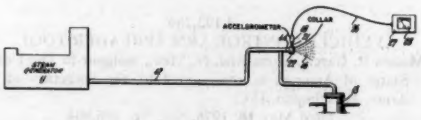
1. An improved exhaust gas oxygen sensor of the type adapted for installation in a conduit for conveying exhaust gases from an internal combustion engine, the improved sensor being responsive to the partial pressure of oxygen in the exhaust gases to which the sensor is exposed and having an electrical characteristic which varies, when the sensor is at operating temperatures in the range from about 350° C. to about 850° C., with the partial pressure of oxygen in the exhaust gases, the sensor comprising:
a body adapted for connection to the exhaust conduit of an internal combustion engine;
a ceramic insulator having a projecting portion and a terminal-pin portion, the ceramic insulator being received within the body and being positioned such that the projecting portion is adapted to project into the exhaust conduit when the body is connected thereto as adapted therefor, the projecting portion of the insulator being of circular cross-section and having a plurality of passages extending therefrom to the terminal-pin portion of the insulator, the passages having their centers located substantially equidistant from the axis of the projecting portion, the insulator projecting portion having a pedestal of circular cross-section, and the pedestal having a radius smaller in length than the distance from the axis of the projecting portion to the centers of the passages;
an oxygen sensing element supported by the projecting portion of the insulator and positioned adjacent the pedestal thereof, the oxygen sensing element being responsive to the partial pressure of oxygen in exhaust gases, the oxygen sensing element having a plurality of electrical lead wires connected thereto, the electrical lead wires each extending through a different one of the passages in the insulator to the terminal-pin portion thereof, the pedestal of the insulator restricting bending of the electrical lead wires in the region between the oxygen sensing element and the passages.

4,193,290

STEAM QUALITY ACOUSTIC MONITORING SYSTEM AND METHOD

Alvin J. Sustek, Jr., and Thomas G. Scott, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 17, 1978, Ser. No. 925,134
Int. Cl.[2] G01N 29/02
U.S. Cl. 73—29 **6 Claims**



1. Steam quality monitoring system for use with steam injection wells or the like, comprising
a conduit for delivering steam to be utilized,
an orifice connected to said conduit for permitting said steam to escape therethrough,
a sound transducer physically coupled adjacent to said orifice for generating sonic range frequency signals in accordance with sonic vibrations created by said steam flow through said orifice, and
means indicating the quality of said steam in response to the amplitude of said sonic signals at a predetermined frequency.

4,193,291

SLOW TORSIONAL WAVE DENSITOMETER

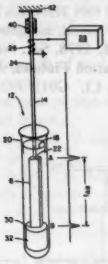
Lawrence C. Lynnworth, Waltham, Mass., assignor to Panametrics, Inc., Waltham, Mass.

Filed Feb. 27, 1978, Ser. No. 881,753
Int. Cl.[2] G01N 9/24
U.S. Cl. 73—32 A **46 Claims**

1. An acoustic system for measuring at least the density-dependent parameter of a fluid, comprising
transducer means for transmitting and receiving an acoustic wave responding to the torsional mode complex propagation constant γ,
a sensor acoustically coupled to said transducer means that propagates said torsional wave axially in a guided mode, said sensor having a noncircular cross section in a plane

transverse to said axial direction and being at least partially immersed in said fluid,

said torsional wave having a velocity of propagation c_f along said immersed sensor portion that is less than the velocity of propagation of said wave along said sensor in a vacuum,



and the magnitude of the ratio of said reduction in propagation velocity to said propagation velocity in vacuum being a substantially linear function of the density of said fluid, and

electronic means for measuring said velocity reduction.

4,193,292

INDICATING DEVICE FOR VACUUM CLEANERS

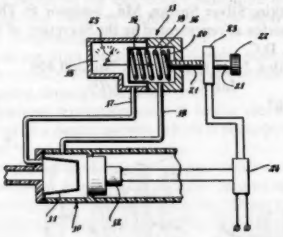
Sven B. Simonsson, Tyreso, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Jan. 5, 1979, Ser. No. 1,144

Claims priority, application Sweden, Jan. 11, 1978, 7800296

Int. Cl.[2] G01L *7/08*; B01D *46/04*

U.S. Cl. 73—38 **7 Claims**



1. An arrangement for indicating the degree of clogging of a dust container for a vacuum cleaner, or the like, comprising a spring, a pressure sensing means, which under the influence of a pressure differential between the outside and inside of said dust container is movable against the force of said spring, a signalling device visible from the exterior of said vacuum cleaner for a continuous visual indication of the degree of clogging of the dust container and being operatively connected to said pressure sensing means, said vacuum cleaner having a motor regulator for varying the amount of the motor output, and said motor regulator being provided with a device for selective variance of the tension of said spring against the force causing said pressure sensing means to be movable.

4,193,293

APPARATUS FOR DETERMINING BLOOD ELASTICITY PARAMETERS

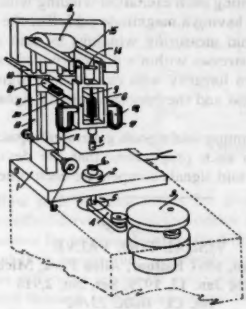
Francesco Cavallari, Milan, Italy, assignor to E.L.V.I. S.p.A., Milan, Italy

Filed Apr. 25, 1978, Ser. No. 900,057

Claims priority, application Italy, Apr. 28, 1977, 22920 A/77

Int. Cl.[2] G01N *33/16*

U.S. Cl. 73—64.1 **8 Claims**



1. An apparatus for determining blood elasticity parameters, comprising in combination: a cylinder rotatably carried about its vertical axis and suitable to be immersed in a blood container subjected to regular oscillations; a magnetic transducer for the cylinder oscillations connectable to an apparatus for recording the amplitude of the cylinder oscillations; the cylinder being rigidly suspended from a frame oscillating in line with the cylinder axis and being mechanically connected to a magnetic device exerting a reaction moment, said device comprising a ferromagnetic core rotating in a uniform magnetic field.

4,193,294

MAGNETOELASTIC TRANSDUCER WITH LINEAR AND TEMPERATURE-INDEPENDENT CHARACTERISTIC

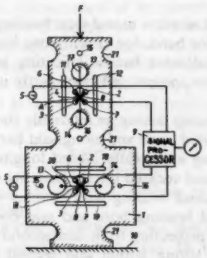
Lennart Forslund, Brunflo; Stig Jordinger, and Pavel Kolavcic, both of Vesteras, all of Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

Filed Dec. 22, 1977, Ser. No. 863,531

Claims priority, application Sweden, Dec. 28, 1976, 7614600

Int. Cl.[2] G01L *1/12*

U.S. Cl. 73—141 A **8 Claims**



1. A force measuring magnetoelastic transducer for generating an output signal dependent on a mechanical force acting on the transducer, comprising:

a core of magnetostrictive material including at least two groups of first apertures, each group including excitation and measuring windings and between which at least one measuring zone is formed, in which the dominating part of

the magnetic flux appears and in which the stress therefore determines the signal from the measuring winding;

said core further including second apertures other than said two groups of first apertures for controlling the force flux, and being arranged in spaced relation from said two groups of first apertures to form at least one measuring zone substantially subjected to compressive stress and to form at least one measuring zone substantially subjected to tensile stress when a force is acting on the transducer;

means for exciting each excitation winding with an alternating current having a magnitude such that the signals generated in said measuring windings by said compressive and tensile stresses within a predetermined range of load deviate from linearity with one polarity signal for compressive stress and the opposite polarity signal for tensile stress; and

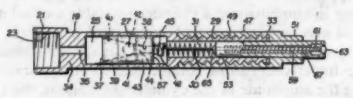
means for summing said signals generated in said measuring windings in such proportions that the deviations from linearity of said signals compensate each other.

4,193,295

VISUAL TIRE VALVE

William F. Curran, 6561 Balfour, Allen Park, Mich. 48101

Filed Jan. 12, 1979, Ser. No. 2,915
Int. Cl.[2] B60C *23/02*
U.S. Cl. 73—146.8 **16 Claims**



1. A visual tire valve adapted for mounting over a tire valve stem comprising a stem housing having an internally threaded collar at one end mounted upon said valve stem; an elongated bore intermediate said housing ends, and an externally threaded barrel at the other end of said housing having a counter bore communicating with said bore;

the stem housing including an apertured head between said collar and bore;

a cylindrical bolt slidably mounted in said bore having an axial aperture at one end terminating in a tapered bore;

a ball valve normally seated on said tapered bore having a stem projected loosely through said bolt aperture and outwardly thereof;

there being three annular bands of different colors end-to-end over the exterior of said bolt, for indicating over inflation, proper inflation, and under inflation, respectively;

a transparent window in said stem housing of the same width as one color band, for viewing one band and alternately, parts of adjacent bands indicating selectively the tire pressure; i.e., proper inflation, partly under or over inflation;

a second housing having an internally threaded bore adjustably mounted upon and along said barrel;

a stem having a normally closed longitudinal bore axially mounted and secured intermediate its ends upon one end of said second housing with its inner end extending into the second housing bore and said counter bore and its other end projecting from said second housing;

a calibrated spring within said second housing and stem housing interposed in compression between said bolt and stem;

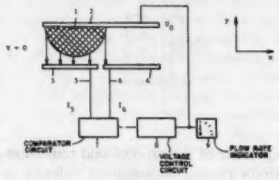
and a normally seated spring biased air flow control rod within said latter stem having enlarged heads at its opposite ends closing off air communication through said stem and upon application thereto of air pressure for inflation of said tire adapted to unseat for transmitting compressed air through said stem and housings, unseating said ball valve, and through said tire valve stem until an intermediate color registers with said window.

4,193,296

METHOD AND AN INSTRUMENT FOR THE MEASUREMENT OF THE FLOW RATE OF GASES BASED ON IONIZATION

Kauko Janka, Tampere, Finland, assignor to Wallac Oy, Finland

Filed Jul. 31, 1978, Ser. No. 929,236
Claims priority, application Finland, Aug. 1, 1977, 772326
Int. Cl.[2] G01F *1/56*
U.S. Cl. 73—194 F **7 Claims**



1. Method of measuring the flow rate of a gas stream, comprising the steps of:

placing a source of ionization in said gas stream;

placing first, second and third electrodes in the stream of gas ionized by said source, the second and third electrodes being spaced from each other in the direction of flow and both being spaced from the first electrode in a direction transverse to said flow;

establishing a first electrical potential between the first and second electrodes and a second electrical potential between the first and third electrodes to generate first and second electrical currents in said stream of ionized gas;

adjusting the first and second electrical potentials to obtain first and second electrical currents of predetermined relative value;

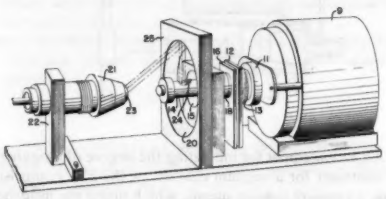
the flow rate being a function of the ratio between said first and second potentials.

4,193,297

INFRARED FUZE TEST SIMULATOR

Gerald N. Plotkin, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 31, 1963, Ser. No. 300,409
Int. Cl.[2] F42C *21/00*
U.S. Cl. 73—167 **9 Claims**



1. An infrared fuze test simulator for simulating the infrared pattern which would be received by a spinning fuze in flight comprising

a stationary mounting adapted to support a fuze having an infrared admission area,

a variable high intensity infrared point source spaced from said fuze along the spin axis thereof,

means for collimating the infrared radiation given off by said infrared point source into a beam and directing the beam along said spin axis,

rotating miror means between said fuze and said infrared point source and located on said spin axis for reflecting said beam radially outward from said axis and causing said beam to sweep through a circular path around said spin axis,

stationary annular mirror means surrounding said rotating mirror means for receiving the beam from the rotating mirror means and directing the radiation upon said infrared admission area of the fuze at a predetermined angle with the fuze axis,

means disposed in the path of said beam for attenuating the intensity of said beam,

means disposed in the path of said beam for passing a desired wavelength of said beam,

means disposed in the path of said beam for changing the cross-sectional shape and size of said beam,

and shutter means disposed in the path of said radiation for controlling the rate of increase of radiation intensity at the infrared admission area.

4,193,298

EXCITATION SYSTEM FOR ELECTROMAGNETIC FLOWMETER

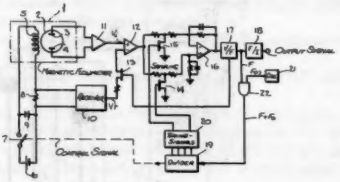
Nagaoki Kayama, and Kazuie Suzuki, both of Tokyo, Japan, assignors to Hokushin Electric Works, Ltd., Tokyo, Japan

Filed Aug. 21, 1978, Ser. No. 935,133

Claims priority, application Japan, Aug. 24, 1977, 52-100623

Int. Cl.² G01F *1/60*

U.S. Cl. 73—194 EM **5 Claims**



1. A method for exciting the electromagnet of a magnetic flowmeter in which a fluid to be metered is conducted through a flow tube provided with detecting electrodes, the fluid intercepting a magnetic field established by the electromagnet to induce a signal in the electrodes indicative of flow rate in a high flow-rate range as well as in a low flow-rate range, the method comprising the steps of :

A deriving from the electrode signal a control signal having a frequency which is a function of the velocity of the fluid passing through the tube;

B supplying excitation current to the electromagnet in the form of a direct current which is periodically interrupted; and

C governing the frequency of interruption of the excitation current in accordance with the control signal so that the interruption frequency of the excitation current is higher in the high flow-rate range and lower in the low flow-rate range.

4,193,299

APPARATUS FOR METERING FLUID FLOW

Heinz Holzem, Monchengladbach, and Hans J. Henning, Neuss, both of Fed. Rep. of Germany, assignors to Pierburg Luftfahrtgerate Union GmbH, Neuss am Rhein, Fed. Rep. of Germany

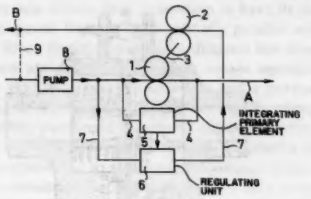
Filed Jun. 13, 1978, Ser. No. 915,230

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728250

Int. Cl.² G01F *15/02*

U.S. Cl. 73—199 **13 Claims**

1. Apparatus for providing a continuous instantaneous measurement of a flowing fluid and for effecting dosing of said fluid at a particular flow rate, especially for use in fuel systems for combustion engines, comprising: means defining a main flow path for said flowing fluid; a displacement flow meter connected in said main flow path; servodrive means consisting essentially of a hydraulic motor for providing driving energy to said displacement flow meter to overcome the inherent frictional resistance thereof; by-pass means connected with



said main flow path defining means for diverting fluid flow therefrom to effect driving of said servodrive means; a pressure difference sensor for sensing the pressure difference across said displacement flow meter; and regulating means responsive to said pressure difference sensor for controlling the flow of said diverted fluid through said by-pass means thereby to control operation of said servodrive means in accordance with the pressure difference across said displacement flow meter.

4,193,300

SIGNAL LINEARIZING CIRCUIT FOR INTERNAL COMBUSTION ENGINES

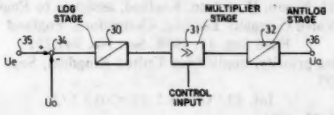
Cornelius Peter, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 17, 1978, Ser. No. 925,488

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732715

Int. Cl.² G01F *1/68*

U.S. Cl. 73—204 **7 Claims**



1. A circuit arrangement for linearizing the output signal of a quantitative measuring probe preferably arranged as a bridge circuit including a temperature-dependent resistor and adapted particularly for the measurement of the quantity of air flowing in the intake manifold of an internal combustion engine, comprising in combination, a log stage, a multiplier stage and an antilog stage connected in series and means for feeding the probe signal to the input of said log stage to produce a linearized output signal at the output of said antilog stage.

4,193,301

FLOW METER

Antonio Ferrentino, Monza, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Oct. 5, 1978, Ser. No. 948,808

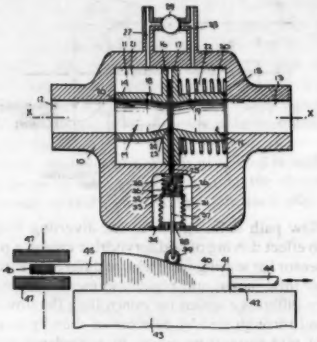
Claims priority, application Italy, Jan. 13, 1978, 19227 A/78

Int. Cl.² G01F *1/22*

U.S. Cl. 73—207 **10 Claims**

1. A fluid flow-meter, particularly adapted for measuring the flow of oil that feeds an oil-filled electric cable, having a body including a through-cavity comprising first and second chambers and means defining an opening interconnecting said chambers, means for sensing differences in pressure existing in said first and second chambers, movable means positioned at said

opening for varying the area of said opening through which fluid can flow, said movable means comprising a slidable lamina having an aperture therethrough, the lamina being arranged to slide transversely of the through-cavity and perpendicular to an axis of the through-cavity from position in which said aperture is aligned with said opening to a position in which said lamina blocks said opening, whereby sliding movement of said lamina varies the area of said opening through which fluid



can flow to any condition from closed to fully open, and means for moving said movable means to maintain a preset and constant difference between the pressures in said chambers for any rate and direction of flow therethrough, said means for moving the movable means comprises a movable cam having a cam surface and wherein said lamina has a feeler connected thereto and engaging said surface, said cam being movable to vary the position of said lamina in accordance with the pressure difference between said first and second chambers.

4,193,302

METHODS AND APPARATUS FOR EXAMINATION OF SURFACE TEMPERATURE DISTRIBUTION

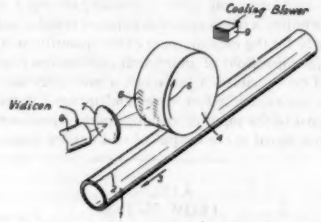
Ralph D. Nixon, Braintree, England, assignor to English Electric Valve Company Limited, Chelmsford, England

Filed Sep. 11, 1978, Ser. No. 941,252

Claims priority, application United Kingdom, Sep. 15, 1977, 38452/77

Int. Cl.[2] G01D 5/26; G01J 5/26

U.S. Cl. 73—351 **7 Claims**



1. An arrangement for monitoring the temperature distribution across the surface of a body, said surface having a relatively low thermal emissivity, said arrangement comprising:

a transfer member formed of a material of relatively low thermal conductivity and having a contact surface of relatively high thermal emissivity, said transfer member being a roller arranged to roll over said body surface, said contact surface of said roller being the rim (or rolling surface) thereof, said rolling carrying said rolling surface into, and subsequently out of, contact with said body surface, so that said rolling surface is first brought into contact with said body surface thereby effecting a transference of heat in the form of a thermal image from the latter to the former, and is thereafter removed therefrom; and

a pyroelectric vidicon camera tube arranged to receive and measure thermal radiation emitted by said roller's rolling surface so as to monitor the temperature distribution of said rolling surface, thereby effectively monitoring the temperature distribution across said body surface.

4,193,303

LEVEL AND DENSITY-METER

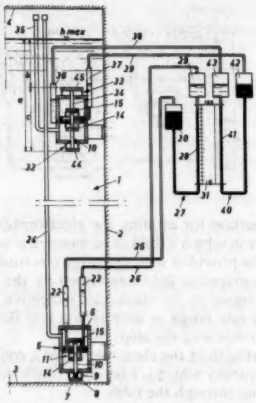
Axel Egnell, Kungsgatan 20, 440 30 Marstrand, Sweden

Filed Feb. 17, 1978, Ser. No. 878,828

Claims priority, application Sweden, Feb. 17, 1977, 7701740

Int. Cl.[2] G01N 9/28

U.S. Cl. 73—438 **9 Claims**



1. An apparatus for indicating the liquid level and density of a liquid in a tank, said apparatus comprising:

a first pressure-sensitive transmitter placed at or close to the bottom of the tank;

second and third pressure-sensitive transmitters placed at different fixed distances below a highest permitted liquid level, said transmitters including means for compensating for variations in gas pressure in the tank;

first indicator means, responsive to said first pressure-sensitive transmitter, for indicating the density of said liquid when said highest permitted liquid level is reached;

means for converting the pressure upon each of said second and third pressure-sensitive transmitters into signals, said means for converting having conversion factors with the ratio of said conversion factors the inverse of the ratio of the distances from the respective transmitters to the highest permitted liquid level; and

a second indicator means, indicating the difference between said signals from said second and third transmitters, for providing an indication of when the highest permitted liquid level is approached.

4,193,304

METHODS OF AND APPARATUS FOR BALANCING A ROTOR

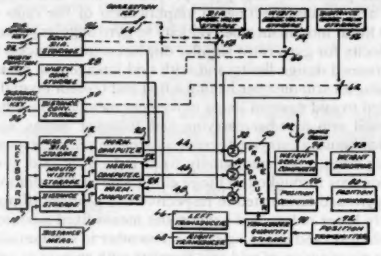
Dionys Hofmann, Darmstadt, Fed. Rep. of Germany, assignor to Gebr. Hofmann, G.m.b.H. & Co. KG, Maschinenfabrik, Darmstadt, Fed. Rep. of Germany

Filed Aug. 8, 1978, Ser. No. 932,296

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1977, 2737524

Int. Cl.[2] G01M *1/16*

U.S. Cl. 73—462 20 Claims



1. A method of balancing a rotor on which geometric dimensions are provided in one or several planes, comprising the steps of:

applying said geometric dimensions in the form of at least one of absolute metric units and absolute English units to an electronic measurement system;

converting said geometric dimensions to predetermined units;

producing a signal related to the imbalances in said rotor by means of transducers;

correcting said geometric dimensions with correction values, said correction values compensating for the difference in position between the center of gravity of a counterweight applied during imbalance compensation and said geometric dimensions; and

following the step of correcting, determining the imbalance angular position and magnitude of said imbalance from said signal and the corrected geometric dimensions.

4,193,305

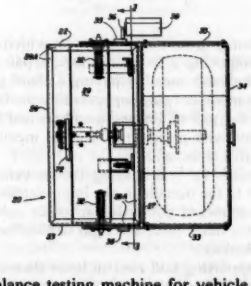
VEHICLE WHEEL AND TIRE BALANCE TESTING MACHINE

Lee Hunter, 13501 Ladue Rd., Ladue, Mo. 63141

Filed Aug. 16, 1978, Ser. No. 934,008

Int. Cl.[2] G01M *1/16*

U.S. Cl. 73—462 11 Claims



1. In a balance testing machine for vehicle wheel and tire assemblies having inside and outside reference planes representing the thickness of the assembly as measured along the axis of rotation, the combination comprising: a frame; a drive shaft in said frame; an unbalance force sensitive member in said frame; a drive motor connected to said drive shaft; a driven shaft carried by said force sensitive member and flexibly connected to said drive shaft; a plurality of flexible means supporting said force sensitive member in operative position in said frame to permit said force sensitive member to react in response to unbalance forces substantially only on one plane, said flexible means being directed at substantially right angles to said force sensitive member; a wheel and tire assembly rotatively carried by said driven shaft in position to have its inside reference plane spaced from and substantially parallel with a portion of said force sensitive member a distance less than its outside reference plane; force transducer means operatively disposed under preload between said frame and a portion of said force sensitive member for substantially rigidly engaging the same and being positioned outside of alignment with and spaced from the inside and outside reference planes a fixed distance; means connected to said force transducer means for converting the unbalance force sensed thereby into terms of counter balancing weight; and monitoring means responsive to rotation of said wheel and tire and adapted to locate the angular position of unbalance about the circumference of the wheel and tire.

4,193,306

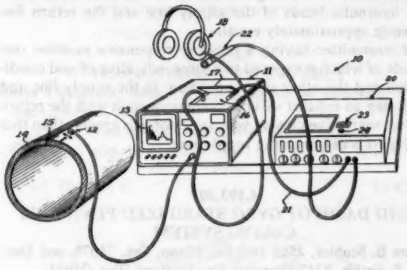
ULTRASONIC TESTING SYSTEM

John J. Flaherty, Elk Grove Village, and Eric J. Strauts, Park Ridge, both of Ill., assignors to Magnaflux Corporation, Chicago, Ill.

Filed Oct. 19, 1978, Ser. No. 952,844

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—629 10 Claims

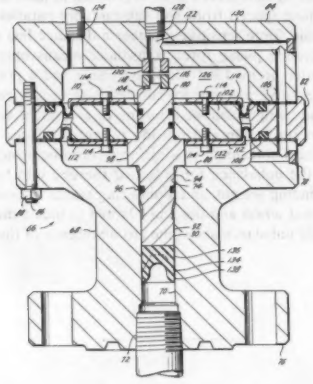


1. In an ultrasonic pulse-echo instrument for detection of defects in a solid part, transducer means, transmitting and receiving means for energizing said transducer means to transmit a burst of ultrasonic energy into the part and for developing echo signals in response to reflections from defects within the part, said transducer means being arranged for back and forth movement toward and away from a defect to obtain a variable length wave transmission path between said transducer means and the defect, doppler circuit means coupled to said transmitting and receiving means for responding to changes in the timing of said echo signals relative to the transmitted bursts and for developing a doppler signal at an audible frequency proportional to the rate of change in the effective length of said variable length wave transmission path, and means for applying said doppler signal to electro-acoustical transducer means to produce an audible signal in response to said movement of said transducer means toward and away from the defect.

4,193,307
APPARATUS FOR INDICATING SUBSEA WELL HEAD PRESSURE

Gerald S. Baker, and Guerry L. Hahn, both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Jun. 14, 1978, Ser. No. 915,538
Int. Cl.[2] G01L 7/16
U.S. Cl. 73—701 11 Claims



1. Apparatus for indicating, at an upper level, a remote subsea condition which condition can exert a force indicative thereof, comprising

a reservoir of hydraulic fluid at the upper level,

means for pumping fluid from the reservoir to a supply line,

pressure indicating means in the supply line at the upper level,

a hydraulic transmitter at the remote subsea level,

said supply line being connected to the transmitter,

a return line connecting the transmitter to the reservoir,

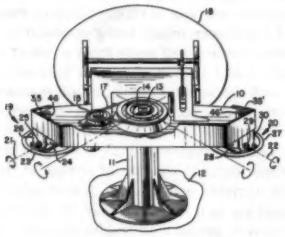
the hydraulic heads of the supply line and the return line being approximately equal,

said transmitter having a pressure responsive member one side of which is exposed to a force indicative of said condition and the other side to pressure in the supply line and having an exhaust valve in communication with the return line, said valve closing when said force is greater than that due to pressure in the supply line.

4,193,308
FLUID DASHPOT GYRO STABILIZED PLATFORM CAGING SYSTEM

William B. Stuhler, 2502 18th St., Plano, Tex. 75075, and Dorsey T. Smith, 3217 Sheridan Dr., Garland, Tex. 75041

Filed Sep. 27, 1976, Ser. No. 727,161
Int. Cl.[2] G01C 19/04
U.S. Cl. 74—5.22 4 Claims

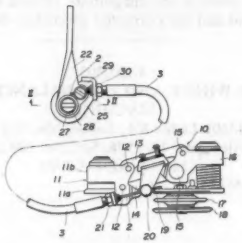


1. A fluid caging system for a platform mounted gyro having a single degree of freedom, wherein the gyro rotor assembly housing is gimbal pivotally mounted with respect to said platform to define a precession axis relative to said platform, comprising: a gyro stabilized platform; a gyro with a gyro rotor assembly gimbal pivotally mounted with a single degree of freedom; dashpot means affixed to said platform and having a linear movement member extending therefrom along a linear motion axis normal to the median general rotational plane of said gyro rotor, a toggle linkage arm means having respective ends thereof pivotally connected to said dashpot linear movement member and said gyro rotor housing about respective pivot axis parallel to said gyro precession axis; said toggle linkage arm means effecting an amplification of the ratio of dashpot linear motion member velocity to gyro angular precession velocity for gyro rotor angular displacements in excess of predetermined design limits; and with said linkage arm means comprising an arm member having a first end thereof pivotally connected to said dashpot linear movement member, the other end of said arm member carrying cam-follower means, said gyro rotor housing carrying thereon an arcuate cam-face member being defined by substantially fixed radii from said gyro precession axis throughout a range either side of the spin axis of said gyro and terminated in respective end portions of progressively lesser radius; and guide roller means fixed mounted to said platform and engaging said arm member to substantially preclude pivot action of said arm member with respect to said dashpot linear movement member; whereby precession movements of said gyro are substantially non-restricted over a predetermined range of precession angles and damped beyond said predetermined range.

4,193,309
SPEED-CHANGING DEVICE FOR BICYCLE

Masashi Nagano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 19, 1976, Ser. No. 706,372
Claims priority, application Japan, Aug. 1, 1975, 50-94647; Dec. 29, 1975, 50-180312[U]; Apr. 27, 1976, 51-54117[U]
Int. Cl.[2] F16H 11/00; G05G 11/00, 1/00; F16C 1/10
U.S. Cl. 74—217 B 4 Claims



1. In a speed-changing device for a bicycle which comprises:

a derailleur comprising a fixing member, a pair of linkage members, a movable member having a chain guide cage, said movable member being supported by the fixing member through the pair of linkage members and being relatively movable with respect to the other members,

a movable control lever, and

transmitting means for transmitting the movement of the control lever to the derailleur, the improvement wherein:

said transmitting means comprises an outer cable, a relatively inflexible inner cable and rigid sleeves for said inner cable fixed thereto;

a fixed body supporting said control lever therewith;

retaining means for retaining said outer cable at one end thereof to said fixed body and retaining the other end thereof to one of said fixing member and one of said pair of linkage members; and

said inner cable being within said outer cable and extending

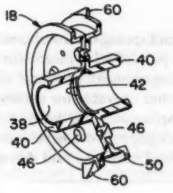
at each end thereof in a substantially straight line beyond the retained ends of the outer cable, said sleeves preventing buckling of the end of said inner cable extending from the end of said outer cable, said inner cable being retained at one end to said control lever and being retained at the other end to one of said fixing member, one of said pair of linkage members, and said movable member, said inner and outer cables being on separate members and movable relative to each other, said sleeves being longer than the maximum exposed portions of the inner cable from said ends of said outer cable and slidable within said retaining means whereby when said control lever is moved, said inner cable is pushed or pulled thereby so that said movable member may move.

4,193,310

IDLER PULLEY

David C. Boyer, Chicago; Arthur J. Danko, Oak Lawn, and William E. Ruehl, Wheeling, all of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 13, 1978, Ser. No. 959,815
Int. Cl.² F16H *55/48*
U.S. Cl. 74—230.3 **8 Claims**



1. A power transmission idler pulley having two identifical half portions including a hub, a web and a rim, means on said web for connecting said two half portions together to form said pulley, said hub having an axial length greater than the width of said rim and having a through bore for mounting on a predetermined diameter axle means, said hub further having a diametral measurement at opposite ends substantially equal to said predetermined diameter and increasing in diameter towards said web whereby said hub initially rides on said axle means only at its free ends but when subjected to a load in a direction perpendicular to the axis of said axle means said hub flexes to bring one intermediate side of said bore into more intimate contact with said axle means and moves the opposite side of said bore away from said axle, the free ends of said bore remaining in contact with said axle means whereby lubricant can be substantially captured within said bore, and diverging means extending radially and laterally outwardly from said rim to insure proper seating of said power transmission means.

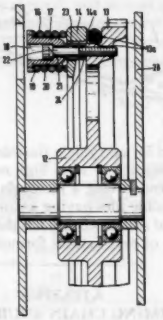
4,193,311

DRIVING PULLEY MECHANISM

Johannes A. Rinio, Versailles, France, and Rodolphe F. Tanson, Moutfort, Luxembourg, assignors to Greifzug Gesellschaft fur Hebezeugbau m.b.H., Bergisch-Gladbach, Fed. Rep. of Germany

Filed Apr. 12, 1976, Ser. No. 675,876
Claims priority, application Fed. Rep. of Germany, May 17, 1975, 2522033
Int. Cl.² F16H *55/36, 55/46*
U.S. Cl. 74—230.5 **6 Claims**

1. A driving pulley mechanism comprising a driving pulley, especially for multiple purpose hoists with a traversing cable, wherein the driving pulley consists of two pulley parts inclined toward each other, each of them carrying at their peripheral edge one cable groove part, and wherein the pulley parts are pressed toward each other at the apex of their peripheral edge which carries the cable, and wherein a plurality of elastical pressing devices are arranged in spaced relationship over the surface of the pulley parts in proximity of the peripheral edge of said pulley parts, and wherein the pulley parts are spread apart by a spreading device at least at one point opposite to the apex carrying the cable, the improvement consisting in that the cable groove part carried by the first pulley part presents one surface which is parallel to the pulley shaft and one surface which is perpendicular to the pulley shaft and fixed relative to said parallel surface, and wherein the cable groove part carried



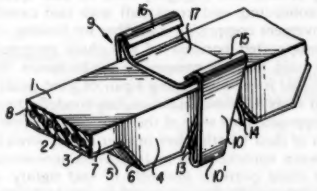
by the second pulley part presents one surface which is perpendicular to the pulley shaft; the second pulley part having a plurality of bores therethrough each bore associated with one of the plurality of elastical pressing devices, each of said elastical pressing devices defining a screw means extending through a bore in said second pulley part and secured to said first pulley part, a bushing and sleeve mounted on said screw means and rigidly connected thereby with said first pulley part, and spring means interposed between said bushing and said second pulley part for biasing said second pulley part against the cable.

4,193,312

TRAPEZOIDAL DRIVING BELT

Mario Cicognani, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Apr. 18, 1978, Ser. No. 897,498
Claims priority, application Italy, May 4, 1977, 23149 A/77
Int. Cl.² F16G *5/20*
U.S. Cl. 74—231 C **11 Claims**



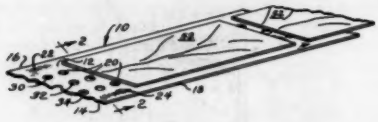
11. A drive belt having an elongated annular elastomeric or plastic body member, a plurality of inextensible reinforcing cords embedded in said body member extending longitudinally therethrough and disposed substantially parallel in transverse spaced relationship, a series of teeth spaced along one side of said elongated body member and a series of rigid wedge-shaped members connected to the teeth and extending along the length of said elongated body member, said wedge-shaped members having a trapezoidal-shaped cross-section perpendicular to the plane of symmetry of the said elongated member.

4,193,313

APPARATUS FOR CARRYING FLEXIBLE GOODS

Warren E. Frandsen, Arlington Heights, Ill., assignor to T & F Industries, Inc., Rolling Meadows, Ill.

Division of Ser. No. 716,377, Aug. 23, 1976, Pat. No. 4,095,606.
This application Dec. 8, 1977, Ser. No. 858,746
Int. Cl.[2] F16G *1/00*
U.S. Cl. 74—231 P **13 Claims**



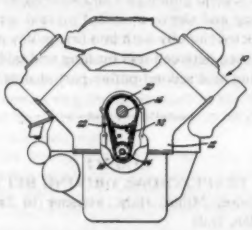
1. A carrier film for carrying a flexible material comprising: a flexible film composed of ultra high molecular weight high density polyethylene having a molecular weight in excess of 3,000,000, said flexible film having a pair of opposed surfaces, one of said opposed surfaces being roughened, said flexible film having a plurality of perforations formed therein.

4,193,314

TIMING CHAIN SNUBBER

Thomas G. Horner, Royal Oak, and Robert A. Ellis, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 22, 1978, Ser. No. 889,133
Int. Cl.[2] F16H *7/18*
U.S. Cl. 74—242.5 **4 Claims**



1. In an internal combustion engine, a frame rotatably supporting a crankshaft and a camshaft in spaced parallel relation, a sprocket mounted on each of said shafts, a timing chain extending around and engaging both of said sprockets for drivably connecting said crankshaft with said camshaft, and the improvement comprising a snubber for limiting vibrations in the unsupported portions of the chain intermediate the sprockets, said snubber comprising guide means fixed with respect to said frame and having a pair of fixed guide surfaces positioned so as to extend in line-to-line nondeflecting contact with the opposed inner sides of the chain unsupported portions over most of their length when in their tightly stretched positions between sprockets, so as to prevent movement of the contacted chain portions inwardly of said tightly stretched positions without affecting movements outwardly thereof.

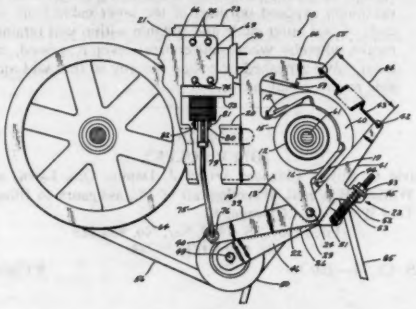
4,193,315

BELT DRIVE SYSTEM UTILIZING AN ADJUSTABLE IDLER MECHANISM

William J. Noe, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Feb. 6, 1978, Ser. No. 875,301
Int. Cl.[2] F16H *7/12*
U.S. Cl. 74—242.11 R **13 Claims**

1. A drive system comprising: a motor; a driven member; drive means including a drive belt for connecting said motor and said driven member; a pair of idler members pivotally movable with respect to each other, one of said idler members including an idler pulley engageable with said drive belt; adjustable means connecting said idler members and including an adjustment member which is operable for automatically providing a positive displacement between said idler members to initially preposition said idler pulley for nominal engagement



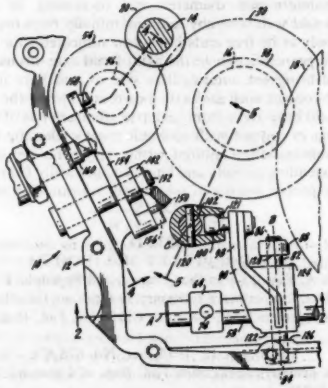
with said drive belt; and spring means operably associated with the assembly of said pair of idler means for biasing said idler pulley into driving engagement with said drive belt, said adjustment member further operable for automatically providing additional positive displacement between said idler members to achieve said driving engagement whereby driving torque may be transmitted from said motor to said driven member.

4,193,316

TRANSMISSION SHIFT CONTROL MECHANISM

Donald W. Kelbel, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 5, 1978, Ser. No. 867,073
Int. Cl.[2] G05G *9/18, 5/10*
U.S. Cl. 74—477 **32 Claims**



1. A transmission shift control mechanism comprising a control shaft rotatable on and slidable along a first axis, an idler lever slidable along a second axis in response to rotation of said control shaft, said idler lever being pivotal about said second axis in response to sliding of said control shaft, a shift rail rotatable on a third axis in response to sliding of said idler lever, said shift rail being slidable along said third axis in response to pivoting of said idler lever, each axis being substan-

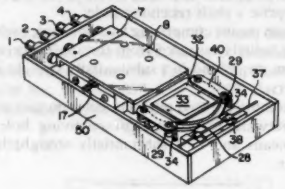
tially normal to the other two axes, and means responsive to rotation and sliding of said shift rail respectively for selecting and engaging at least one transmission ratio.

4,193,317

FINE POSITION CONTROL DEVICE

Hiroshi Oono, and Etuo Shiozawa, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Asaka, Japan

Filed Jan. 30, 1978, Ser. No. 873,659
Claims priority, application Japan, Feb. 9, 1977, 52-14404[U]
Int. Cl.[2] G05G *11/00*; B25B *11/00*; B23Q *3/18*
U.S. Cl. 74—479 **7 Claims**



1. A fine position control device capable of moving a fixed information carrier in the X, Y and Z directions of an orthogonal coordinate system and rotating the same in the X-Y plane, said device comprising:

a Y-direction moving stage,

an X-direction moving stage which moves in the Y-direction together with said Y-direction moving stage and is movable in the X-direction independently of the Y-direction moving stage,

a Z-direction moving stage which moves in the X-Y plane together with a member fixed to said X-direction moving stage and is movable in the Z-direction independently of the X-direction moving stage,

a θ-direction rotating stage which moves together with the said Z-direction moving stage and is rotatable in the X-Y plane independently of the Z-direction moving stage, said θ-direction rotating stage being adapted to hold the fixed information carrier, and

four position control knobs rotatable independently of one another and connected respectively with said X, Y and Z direction moving stages and said θ-direction rotating stage by way of feed screws,

whereby said stages are moved or rotated independently of one another by rotating said position control knobs to finely control the position of the fixed information carrier held on said θ-direction rotating stage.

4,193,318

BRAKE LEVER

Gary L. Golobay, Augusta, Kans., assignor to Conchemco, Incorporated, Lenexa, Kans.

Filed Jan. 27, 1978, Ser. No. 872,809
Int. Cl.[2] G05G *11/00*
U.S. Cl. 74—489 **2 Claims**

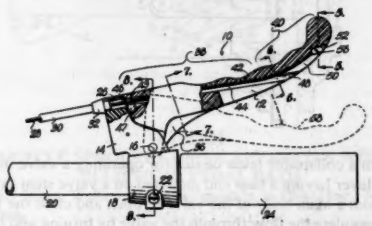
1. In a manually operated control lever assembly of the type including the combination of a support bracket secured to a handlebar or the like, an elongate lever member having one extremity thereof pivotally mounted on said support bracket and a shiftable control cable having one end thereof fastened to said lever member and biased away from said one extremity of said lever member in a direction generally aligned with the longitudinal axis of the latter, the improvement comprising:

means associated with said lever member for confining a portion of the length of the control cable along the length of the lever,

said cable portion being substantially longitudinally coextensive with said lever member and having said one end thereof attached to said lever member adjacent the opposite extremity of the lever;

said means for confining the cable along the length of the lever including a first internal passageway in said lever and a second internal passageway in said lever communicating with the first passageway;

said lever member having an essentially straight stretch adjacent said one extremity thereof, said first passageway being substantially within said straight stretch and conforming thereto, and an arcuate stretch adjacent said opposite extremity thereof, said second passageway being substantially within said arcuate stretch and conforming thereto, whereby to produce a first curvature of the cable adjacent said opposite extremity of the lever member;



said cable portion functioning to transmit a tension force on said opposite extremity of the lever whereby to impose a compressive force on said lever member intermediate said extremities thereof;

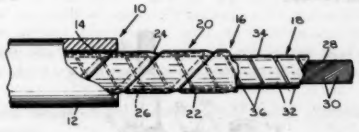
said lever member further including an arcuately shaped cable ramp surface in said first passageway adjacent said one extremity of the lever and slidably engageable with a stretch of said control cable portion when the lever is operated whereby to produce a second curvature of the cable adjacent said one extremity and maximize the tension force upon the opposite extremity of the lever and thus the compressive force upon the lever intermediate its ends.

4,193,319

PUSH-PULL CABLE CORE WITH SELF-LUBRICATING COATING

William D. Langford, Stow, Ohio, assignor to Incom International Inc., Pittsburgh, Pa.

Filed Sep. 5, 1975, Ser. No. 610,592
Int. Cl.[2] F16C *1/10*
U.S. Cl. 74—501 R **13 Claims**



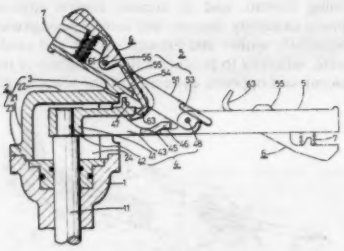
1. A core capable of being utilized within a conduit in a push-pull type remote control cable assembly, said core comprising:

a metallic wire member including a plurality of helically wound strands of wire having at least one flat wire helically wound about an outer surface of plurality of said strands with axial space between adjacent convolutions to provide a substantially even outer surface for said wire member; at least a partial coating on said wire member including an outer layer of TFE resin; and an inner layer of said coating include FEP resin bonded to said wire member to secure said coating to said wire member, said FEP resin layer extending into said space.

4,193,320
COLLAPSIBLE LEVER DEVICE FOR OPERATING VALVE

Kazunari Oota, Hirakata, Japan, assignor to Kubota Ltd., Osaka, Japan

Filed May 8, 1978, Ser. No. 903,482
Int. Cl.[2] G05G 5/06
U.S. Cl. 74—535 **10 Claims**



1. In a collapsible lever device for operating a valve including a lever having a base end mounted on a valve stem extending from a main body of the valve to open and close the valve or to regulate the flow through the valve by turning said lever, the improvement comprising:

a main lever mounted at said base end on the valve stem, said main lever comprising a portion of said lever,

an auxiliary lever having a pivot at a forward end of the main lever, said auxiliary lever comprising a portion of said lever,

a cover covering the base end of the main lever from above and mounted on the valve main body,

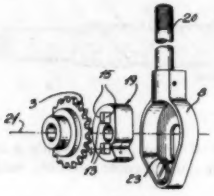
holding means disposed at a position between said pivot and said valve stem while said auxiliary lever is in alignment with the main lever when the auxiliary lever is turned to an unfolded position, and

locking means provided at a position where the auxiliary lever opposes the cover when the auxiliary lever is turned to a folded position.

4,193,321
CAM ARRANGEMENT

Alan M. King, Westmount, Canada, assignor to Vendking International Ltd., Greenfield Park, Canada

Filed May 2, 1977, Ser. No. 792,658
Int. Cl.[2] F16H 53/00
U.S. Cl. 74—567 **5 Claims**



1. A cam arrangement comprising:

cam means having a peripheral camming surface with a variable radius including an abrupt change thereon and a first end face;

cam support means having a first end face;

said first end face of said cam means being adapted to be disposed adjacent to and in contact with said first end face of said cam support means;

means for movably locking said cam means with said cam support means with said end faces adjacent each other;

whereby to provide, to a controlled extent, relative motion between said cam means and said cam support means;

characterized in that said means for movably locking comprises:

a recess in the first end face of said support means;

a mating protrusion means on the first end face of said cam means;

the width of said recess being greater than the width of said protrusion means;

said protrusion means being adapted to be inserted in said recess;

and wherein both said cam means and said support means each comprise a shaft receiving hole;

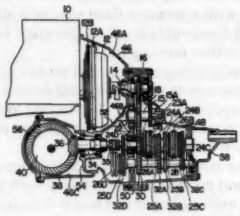
said protrusion means comprising two portions, each portion extending radially outward from the shaft receiving hole of said cam means and in a substantially straight line with each other;

said recess comprising two portions, each portion extending radially outward from the shaft receiving hole of said support means and in a substantially straight line with each other.

4,193,322
CASING FOR POWER TRANSMISSION UNIT FOR AUTOMOTIVE VEHICLE

Hideki Morino, Nagoya, and Yasuyoshi Yasui, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 14, 1978, Ser. No. 877,768
Claims priority, application Japan, Feb. 14, 1977, 52-14789
Int. Cl.[2] F16H 37/08, 57/02
U.S. Cl. 74—700 **2 Claims**



1. For the power transmission unit of an automotive vehicle which has an engine with a crank shaft and a rear end face, a clutch coupled to the crank shaft and having a clutch output shaft and an idler shaft, a change-speed gearing drivingly connected to the clutch via the clutch output shaft and idler shaft which change-speed gearing has a main shaft and a countershaft, and a differential gear assembly drivingly connected to the change-speed gearing for driving at least one pair of wheels of the vehicle,

a casing, comprising:

a first unitary case having a first portion adapted to be securely fixed to the engine rear end face, said first portion defining a forwardly opening first chamber adapted to house the clutch;

said first unitary case further having a second portion located below said first portion, said second portion defining a rearwardly opening second chamber adapted to house at least one part of said change speed gearing;

said first unitary case further having a third portion extending forwardly from said second portion and adapted to be located under the engine, said third portion defining forwardly of said second chamber a third chamber adapted to house the differential gear assembly;

a second unitary case located rearwardly of said first unitary case, said second unitary case defining a forwardly open-

ing fourth chamber adapted to house at least another part of said change-speed gearing;

an intermediate plate interposed between said first and second unitary cases and having bearing surface means thereof for journalling the clutch output shaft, the idler shaft, and the main and counter shafts of the change-speed gearing; and

means detachably bolting the first unitary case, intermediate plate and second unitary case together, sandwich fashion.

4,193,323

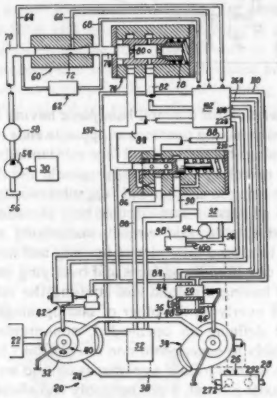
CONTROLS FOR COMBINED HYDROSTATIC AND MULTIPLE SPEED RANGE TRANSMISSION UNITS WITH AUTOMATIC SPEED CONTROL AND BRAKING FUNCTIONS

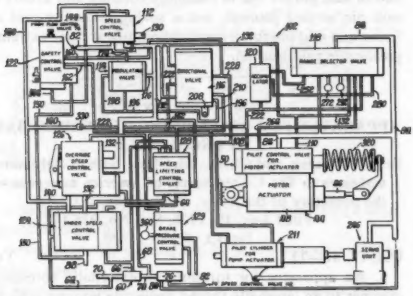
Thomas J. Bubula, Joliet; Maurice F. Franz, East Peoria; Gordon W. Johnson, Peoria, and James D. Rinaldo, Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 609,637, Sep. 2, 1975, Pat. No. 4,080,850. This application Oct. 25, 1977, Ser. No. 844,663

Int. Cl.[2] F16H *47/00*

U.S. Cl. 74—733 **11 Claims**





1. A drive train for coupling a prime mover with an output shaft, comprising

a transmission unit arranged between the prime mover and output shaft and providing a positive coupling during both accelerating and decelerating operation of the drive train, the transmission unit being operable for producing infinitely variable torque transmission and operating speeds,

control means for producing a variable signal to which the transmission unit is responsive for establishing the rate of torque transmission and the operating speed of the transmission unit,

an underspeed control means which is responsive to operation of the prime mover at a speed below a selected minimum value for adjusting the variable signal in order to reduce torque loading of the drive train,

an override speed control means being manually operable for also adjusting the variable signal in order to selectively decrease operating speed of the drive train without necessarily adjusting the control means, and

a speed limiting control means which is responsive to operation of the prime mover at a speed above a selected maximum value for applying brake means within the drive train in order to supplement dynamic braking capacity of the transmission unit.

4,193,324

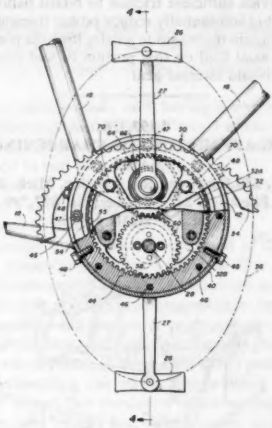
BICYCLE SPROCKET DRIVE APPARATUS WITH ELLIPTICAL PEDAL PATH

Michel Marc, Wellesley, Mass., assignor to Clint, Inc., Natick, Mass.

Filed Dec. 27, 1977, Ser. No. 864,278

Int. Cl.[2] F16H *1/28*; B62M *3/06, 1/02*

U.S. Cl. 74—750 B **9 Claims**



1. Bicycle sprocket drive apparatus mounted on a bicycle frame and for propelling the bicycle, said apparatus comprising;

frame means secured to the bicycle frame, planetary gear means,

housing means for mounting the planetary gear means,

said planetary gear means including a pair of pinion gears each separately, rotatably mounted in the housing means and having axle means for the support thereof extending from opposite sides of said housing each for supporting pedal means,

a sprocket having an elliptical gear path,

whereupon rotation of said pedal means in turn causes rotation of said housing means and sprocket with said pedal means subscribing an elliptical path of rotation, and

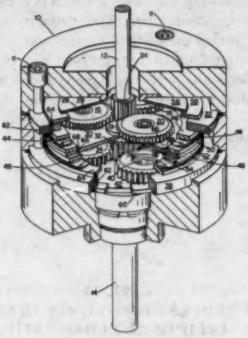
means securing the sprocket to said housing means with the minor axis of the elliptical sprocket substantially coinciding with the major axis of the elliptical pedal path.

4,193,325

GEAR BOX

Alexander P. Cotreau, 21 Peach Orchard Rd., Burlington, Mass. 01803

Filed Nov. 9, 1977, Ser. No. 849,887
Int. Cl.[2] F16H *1/28*
U.S. Cl. 74—801 7 Claims



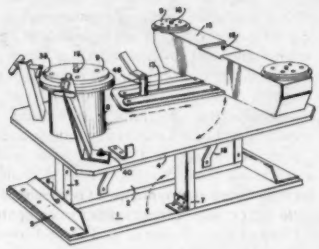
1. In a speed reducing gear box of the type including, for each reducing stage, a plurality of planetary gears revolving about a central sun gear and inside an internal gear, the improvement comprising means to axially load the planetary gears to provide sufficient friction to retard ballotting of said gears but not to substantially reduce power transmission of said gear box, wherein the means to axially load the planetary gears provides an axial load on that portion of said planetary gears engaged with said internal gear.

4,193,326

HOLDING APPARATUS FOR SHARPENING CHAIN SAWS

Alex Dudley, 220 Edgewood Rd., Lansing, Mich. 48910

Filed Feb. 23, 1978, Ser. No. 827,789
Int. Cl.[2] B23D *63/16*
U.S. Cl. 76—74 2 Claims



1. An adapter for supporting a chain saw work holder, said adapter being composed of three latitudinal strips secured to two longitudinal strips, and secured on a base,

means for removably securing a work holder on said adapter, said means being a pin on the far latitudinal strip of said adapter,

means for removably securing a freely swinging pivotal rocking tool on said adapter, said means being the two longitudinal strips, which strips extend beyond the base at the front of said adapter, curving outwardly and downwardly, each having affixed an angle, said angles being bored in the center and angling upward at a 10° angle, leaving an opening, forming a saddle to receive the rocker arm of a pivotal rocking tool,

means for stopping further forward movement of a pivotal rocking tool after determining the root diameter of a cutting link, said means being an angle affixed to the center front of said adapter,

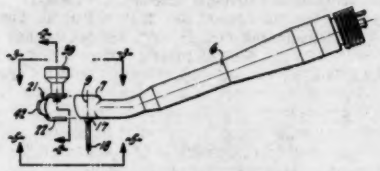
means for removably securing said adapter to any bench or table, said means being a strip secured behind each saddle and extending backwardly therefrom sufficiently to be secured by bolts to any bench.

4,193,327

WRENCH FOR A DENTAL HANDPIECE

Joseph P. Lares, Redwood City, and Albert J. Lares, Portola Valley, both of Calif., assignors to Lares Mfg. Co., San Carlos, Calif.

Filed Sep. 14, 1978, Ser. No. 942,265
Int. Cl.[2] B25B *23/08*
U.S. Cl. 81—55 5 Claims



1. A wrench for a dental handpiece having a shank with an end housing having openings at opposite ends of an axis, one of said openings being in an end face substantially normal to said axis and revealing a non-circular spindle and the other of said openings being in another end face substantially normal to said axis and adjacent a non-circular burr threadedly engageable with said spindle, said wrench comprising a central frame adapted to extend around said housing and having a first end abutting one of said end faces and overlying one of said openings and having a second end abutting the other of said end faces and overlying the other of said openings; means at said first end defining an open-sided, non-circular slot adapted nonrotatably to engage said non-circular burr by a motion in a direction normal to said axis; means on said second end defining a coaxial journal; a pin rotatably and slidably disposed in said journal; means on one end of said pin non-rotatably engageable with said non-circular spindle; means on the other end of said pin for use in manually rotating and axially sliding said pin in said journal; and a spring engaging said central frame and said pin for urging said pin toward one extreme axial position in said journal.

4,193,328

APPARATUS FOR ASSEMBLING THREADED BASE TO A PROJECTILE

Bruce W. Jezek, and Glen L. McClung, both of Baltimore, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 18, 1978, Ser. No. 935,182
Int. Cl.[2] B25B *13/48*
U.S. Cl. 81—72 7 Claims

1. An apparatus for torquing an externally threaded base member to an internally thread projectile housing which comprises:

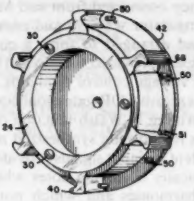
a cup shaped lug housing having an open front side, a rear side, an axially aligned hub section protruding from said rear side said hub section having an axial drive socket disposed therein, an exterior wall of said open front side having a plurality of equally spaced circularly shaped semi-cylindrical lug grooves longitudinally disposed therethrough and positioned in the periphery thereof;

taper locking torquing lug means operatively disposed in said lug grooves for retractably moving out of the way

when said apparatus is inserted in said base member and for frictionally engaging said base member to operatively enable application of a torque force thereto;

retainer ring means, fixedly attached to said open front side of said lug housing for preventing said torquing lug means from sliding out of one end of said lug grooves;

locking plate means, rotatably attached to said rear side of said lug housing for preventing said torquing lug means



from sliding out of the other end of said lug grooves and for camming said lug means into a lug retracted position and into a friction taper lug locking position; and

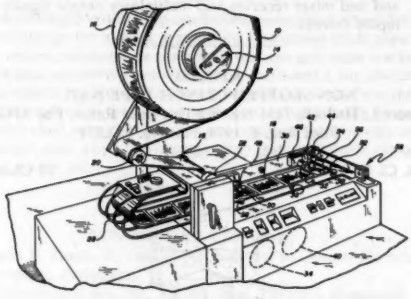
spring biasing means for automatically rotating said locking plate means from said lug retracted position to said lug locking position to enable said base member to be automatically threaded into said internally threaded projectile housing when an appropriately directed torquing force is applied to said axial drive socket of said lug housing.

4,193,329

PHOTOGRAPHIC PAPER CUTTER WITH DAMAGE AVOIDANCE BACK STEP MOTION

Gerald R. Strunc, Maple Grove, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Oct. 10, 1978, Ser. No. 950,129
Int. Cl.[2] B26D *7/06*
U.S. Cl. 83—250 **7 Claims**



1. A strip cutting apparatus for cutting segments from a strip, the apparatus comprising:

step drive means for driving the strip in a stepwise manner along a path;

knife means located along the path, the knife means including a movable blade which moves downward to cut a segment from the strip and upward to retract out of the path of the strip;

blade position sensing means for sensing the position of the movable blade; and

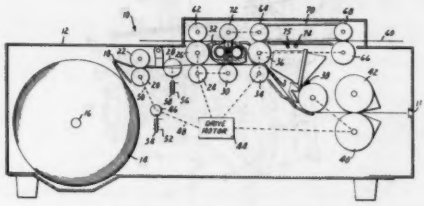
control means for receiving signals from the blade position sensing means and causing the step drive means to drive the strip in a reverse direction for a predetermined number of steps after the movable blade has cut a segment from the strip and before the movable blade is retracted.

4,193,330

COPY MACHINE WITH AUTOMATIC ROLL SUPPLIED COPY PAPER FEEDING AND CUTTING APPARATUS AND CONTROL CIRCUITRY

Michael P. Knox, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 25, 1978, Ser. No. 945,407
Int. Cl.[2] B26D *5/38*
U.S. Cl. 83—364 **3 Claims**



1. An electrically operated copy machine having a transferring mechanism driven by a drive motor for providing synchronous movement in the copy machine of copy paper and original sheets of varying lengths where the copy paper is provided by a continuous web of copy paper from a copy paper supply roll and apparatus and circuitry responsive to the presence and absence of the original for cutting sheets from the copy paper which correspond to the length of the original including:

first and second copy paper feed rollers included in the transferring mechanism, said first feed roller positioned between the copy paper supply roll and said second feed roller;

first and second solenoids, each having a winding;

a cutter positioned in the path of travel of the copy paper between said first and second feed rollers and operatively connected to said first solenoid;

first and second electrical power conductors, each connected to a different side of the electrical power presented during operation of the copy machine;

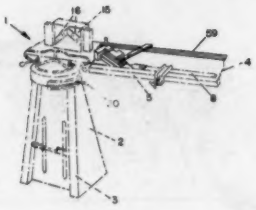
first and second switch means connected to said first and second conductors, respectively, said first and second switch means spaced a short distance apart and positioned along the path of travel of an original sheet for responding to the presence and absence of original sheets presented to the copy machine, said first switch means positioned first in the path of travel of an original sheet, said first switch means connecting one end of the winding of said first solenoid to said first conductor when an original sheet is not presented to said first switch means and connecting one end of the winding of said second solenoid to said first conductor when an original sheet is presented to said first switch means, said second switch means connecting the other end of the winding of said second solenoid to said second conductor when an original sheet is not presented to said second switch means and connecting the other end of the winding of said first solenoid to said second conductor when an original sheet is presented to said second switch means; and

a clutch adapted for control by said second solenoid and operatively engaged between the drive motor and said first feed roller for providing sufficient rotation of said first feed roller to move the copy paper from said cutter to said second feed roller following energization of said second solenoid in response to detection of the leading edge of an original sheet at said first switch means and deenergization of said second solenoid in response to detection of the leading edge of the original sheet at said second switch means.

4,193,331
ADJUSTABLE MEASURING GUIDE ATTACHMENT FOR A PICTURE FRAME MITERING APPARATUS

David L. Gathings, 4875 Ridenour Dr., Colorado Springs, Colo. 80916

Filed Nov. 27, 1978, Ser. No. 963,810
Int. Cl.[2] B26D 7/16
U.S. Cl. 83—468 10 Claims

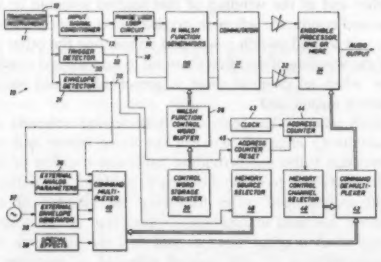


1. In combination with a picture frame mitering apparatus including an upright frame with a vertically reciprocable triangularly shaped cutting head therein, and a horizontally disposed and transversely extending flat supporting arm thereon, scale means on said arm, guide bar means at the forward edge of said arm for retaining a length of mitered rabbited molding strip thereon, retainer bar means associated in parallel engagement with said guide bar means, of a measuring guide attachment comprising a flat base extension attached endwise of said retainer bar and extending angularly therefrom at forty-five (45°) degrees, several flat superposed plate members slidably arranged on said base and being slidably interconnected for lengthwise adjustment relative thereto to provide edge means thereon at an angle of forty-five (45°) degrees for engaging with one mitered end of said rabbited molding strip, flat locator arm means on one of said plate members and projecting over said scaled supporting arm at an angle of forty-five (45°) degrees for alignment with the scale markings thereon, and an angularly shaped flat rabbit locator plate arranged on one of said plate members and projecting forwardly therefrom for interfitting under said mitered rabbited molding strip whereby said retainer bar and measuring guide attachment securely retain said molding strip on said arm for lengthwise measuring adjustment thereof until a predetermined length measurement is reached at which the opposing end of said strip is severed to provide a rabbited molding strip of exact measurement for assembly into a frame.

4,193,332
MUSIC SYNTHESIZING CIRCUIT

Charles B. Richardson, 1104 N. 17th St., Nederland, Tex. 77627

Filed Sep. 18, 1978, Ser. No. 943,058
Int. Cl.[2] G10H 3/00
U.S. Cl. 84—1.01 21 Claims



4. For use in a music synthesizer, a circuit which forms N output signals where N is a whole number integer and the output signals are suitable for mixing to form synthesized music, the apparatus comprising:

(a) a phase lock loop circuit means having an input comparator receiving an input reference signal;

(b) a voltage control oscillator having an input terminal connected to said comparator;

(c) M stages of binary dividers connected in cascade and provided with the output signal from said voltage control oscillator;

(d) a feedback loop connected from said M cascaded dividers to said comparator wherein said comparator means is constructed and arranged to form a comparison of the phase of the signals provided thereto and to form a control signal for said voltage control oscillator; and

(e) a plurality of exclusive OR gates connected to said digital dividers for forming N Walsh function output signals.

13. An apparatus for forming synthesized music which is at least in part dependent on input signals provided thereto which represent monotonically occurring notes which notes have a fundamental and harmonics and which notes further have musical qualities including timbre, pitch, harmonic mix and wherein the apparatus comprises:

(a) a low pass filter for receiving signals representative of a series of monophonically occurring musical notes;

(b) means connected to said low pass filter for receiving the signal passed thereby and which means forms an output signal indicating the occurrence of the start of the monophonically occurring notes, said signal serving as a trigger signal;

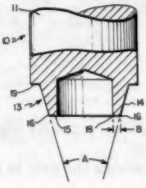
(c) multiplexer means having M inputs thereto and N outputs therefrom, where M is larger than N and M and N are both whole number integers, and the inputs thereto are a set of presets; and

(d) a controllable mixer means for forming synthesized music having the form of a series of output signals representing monotonically occurring synthesized notes wherein said mixer means is controllable in the mixing achieved thereby and incorporates control means which are operated by N preset signals provided thereto from said multiplexer means and said mixing achieved by said mixer means is intitiated by the trigger signal input thereto and said mixer receives said multiplexer output signals as inputs thereto.

4,193,333
NON-SLOTTED CLINCH TYPE NAIL

Robert L. Hallock, 7136 NE. 8th Dr., Boca Raton, Fla. 33431

Filed Aug. 8, 1978, Ser. No. 932,074
Int. Cl.[2] F16B 15/00
U.S. Cl. 85—31 10 Claims



1. A clinch type fastener for driving in and attached to a metallic member comprising a body having a penetrating portion at one end, said penetrating portion including an outwardly extending generally frusto-conical outer wall which tapers from a predetermined diameter adjacent to said body to a smaller diameter remote therefrom at an included angle of at least 28° and not more than 34°, a recess including an inner wall extending axially inwardly from the outer end of said penetrating portion, the outer end of said recess having a predetermined diameter and being generally concentric with the end of said outer wall and defining a blunt continuous generally circu-

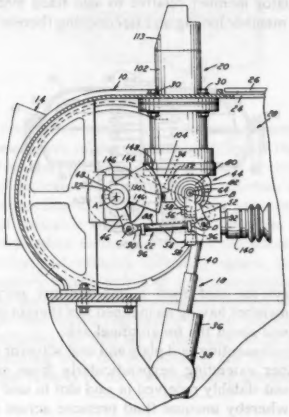
lar ring at the outer end of said penetrating portion, said ring having a substantially constant width of approximately 1/10 of the diameter of said outer end of said recess, and said penetrating portion being heat treated to a hardness greater than the hardness of the metallic member, whereby when the fastener is driven into the metallic member said penetrating portion penetrates the metallic member and such penetration causes said continuous ring to clinch inwardly around its entire periphery and capture a portion of a plug of material within the recess.

4,193,334

GUN SIGHT POSITIONING MECHANISM

Theodore A. Jackson, Utica, Mich., assignor to Cadillac Gage Company, Utica, Mich.

Filed Jul. 31, 1978, Ser. No. 929,393
Int. Cl.[2] F41G 1/40
U.S. Cl. 89—41 E **16 Claims**



1. A gun sight positioning mechanism comprising a parallelogram linkage for moving a gun sight positioning shaft angularly with a gun trunnion shaft such that the gun sight tracks with a gun supported on the trunnion shaft; and a slip clutch that connects the linkage to one of the shafts so as to allow the positioning shaft of the sight to be pivoted independently of the trunnion shaft whereby the sight can be aimed downwardly at the target area while the gun remains aimed upwardly along the projectile path.

4,193,335

GUN MISFIRE CONTROL

Douglas P. Tassie, St. George, Vt., assignor to General Electric Company, Burlington, Vt.

Continuation of Ser. No. 778,769, Mar. 17, 1977, abandoned. This application Aug. 18, 1978, Ser. No. 935,050
Int. Cl.[2] F41D 7/02
U.S. Cl. 89—7 **11 Claims**

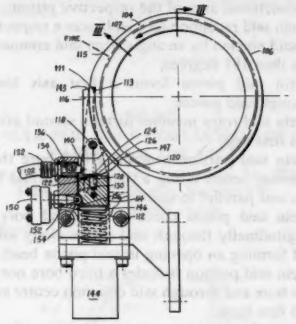
1. An automatic gun having an operating cycle and comprising:

a gun barrel having a gun bore and a projectile receiving chamber;

first means for closing and locking said chamber;

second means operating in synchronism with and controlling the operating cycle of said gun, including a first cam rotating in synchronism with the operating cycle of said gun;

third means coupled to said gun barrel and to said second means for detecting the firing out of a projectile from said chamber, and in the absence of said firing, for positively halting operation of said second means after the time for firing and before the time for unlocking said chamber by said first means, including detent means having a first position whereat it clears said first cam, and a second position whereat it halts said first cam at a first predetermined angular orientation of said first cam; and



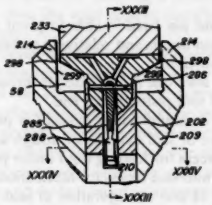
said first cam including additional means to cyclically set said detent means to said second position at a second predetermined orientation of said first cam.

4,193,336

RADIAL PISTON MACHINE WITH FREE-FLOATING PISTON AND PISTON-SHOE ASSEMBLIES

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 528,346, Nov. 29, 1974, Pat. No. 4,037,523. This application Feb. 3, 1977, Ser. No. 765,221
Claims priority, application Austria, May 14, 1974, 3991/74
Int. Cl.[2] F01B 1/06, 13/06, 31/00
U.S. Cl. 91—488 **4 Claims**



1. A radial piston type fluid machine;

comprising a housing, a rotor member rotatably mounted in said housing about a rotor axis and formed with a plurality of angularly spaced and radially outwardly opening cylinders;

a piston radially displaceable in each of said cylinders and having a piston head forming a reception face of a configuration of a radius around a common centre;

a piston shoe associated to each of said pistons and having a radially inwardly projecting portion provided partially with a configuration complementary to that of said reception face and with a radius substantially equal to that of said reception face and around said common centre;

said radially inwardly projecting portion of said piston shoe able to radially engage said reception face of said piston head of the respective piston to be borne thereon and able to pivot thereon;

an actuator ring member radially outward of said rotor member, pistons and piston shoes; said actuator member guiding the strokes of said radially displaceable pistons and of said piston shoes; a pair of end elements carried on one of said members and flanking said piston shoes; said

pistons and piston shoes remaining radially moveably contained between said rotor member, said actuator ring member and said end elements, and,

wherein said common centre is located in said portion,

wherein said reception face exceeds eighty percent of the crossectional area of the respective piston;

wherein said reception face embraces a respective portion of said portion by an angle from said common centre of less than 181 degrees;

wherein said piston forms a first axis longitudinally through said piston;

wherein said rotor member forms a second axis normal to said first axis;

wherein said portion contains a first bore through said common centre along a third axis normal to said first axis and parallel to said second axis;

wherein said piston contains a second bore extending longitudinally through said piston along said first axis and forming an opening in said piston head;

wherein said portion includes a third bore normal to said first bore and through said common centre and through said first bore;

wherein a first pin means is provided in said second bore in said piston and extends into said third bore in said portion and through said first bore and through said common centre;

wherein said first pin means has a pin head and a fourth bore extending through said pin head along said third axis;

wherein a second pin means is inserted through said fourth bore in said pin head into said first bore in said portion;

wherein holding means are provided in said second bore in said piston;

wherein said holding means are engaged to said piston and to said first pin means for holding said first pin means on said piston;

wherein a limited space is provided in said portion around said first pin means and said pin head for permittance of movement of said first pin means within said limited space;

wherein said pin head is able to pivot relatively to said second pin means and relatively to said piston shoe and to said portion;

wherein at least one recess extends through said reception face into said piston head; and

wherein a communication passage is provided from the respective of said cylinders through at least said piston to said recess for leading fluid under pressure from said cylinder into said recess for lubrication of said reception face and of said configuration of said portion

whereby the holding of said portion on said piston by outer diameter portions of said piston is excluded for the purpose of utilizing a maximum of the cross-sectional area of said piston for bearing the radial load of pressure in fluid on said piston and thereby assuring high power and efficiency of the fluid machine.

4,193,337

PNEUMATIC ROTARY ACTUATOR

Carlos A. Disdier, 7311 E. 59th Pl., Tulsa, Okla. 74145

Filed Jan. 16, 1978, Ser. No. 869,713

Int. Cl.[2] F01B *3/04*

U.S. Cl. 92—31 **1 Claim**

1. Apparatus for providing rotational torque in response to fluid pressure comprising:

a cup-shaped housing lower portion having an axial opening therein;

a housing upper portion affixed to and closing said housing lower portion;

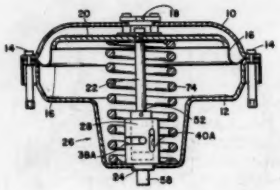
a flexible diaphragm having the periphery thereof secured to the interior surface of the closed housing;

a circular plate within the closed housing, the plate being engaged by said diaphragm and displaced by the application of unequal fluid pressure to opposed sides of the diaphragm;

a tubular cylindrical fixed member supported coaxially within and attached to said housing lower portion, the fixed member having its cylindrical surface radially spaced from said housing lower portion and having a longitudinal opening therethrough coaxial with said housing lower portion opening; the fixed member having a longitudinal slot there through in a plane of the axis of said longitudinal opening;

a rotatable shaft member, the upper portion being received in said fixed member and the lower portion extending out the fixed member and through said housing lower portion opening;

a longitudinal actuator member received in said fixed member, a pin extending from said actuator member received in said longitudinal slot in said fixed member, thereby serving to permit slidable but non-rotatable movement of said actuator member relative to said fixed member; the actuator member having an axial opening therein telescop-



ically receiving said shaft member upper portion, the actuator member having an inclined slot therein defining a partial spiral about the longitudinal axis;

a rod axially connecting said plate and said actuator member;

a pin member extending perpendicularly from said shaft member and slidably received in said slot in said actuator member whereby unequal fluid pressure across said diaphragm displaces said plate, said rod and said actuator member relative to said fixed member and said shaft member whereby the interaction of said pin member in said slot causes said shaft member to rotate;

said fixed member has a semi-circular slot therein in a plane perpendicular said opening longitudinal axis and wherein said pin member extending perpendicularly of said shaft and slidably received in said slot in said actuator member is also received in the fixed member semi-circular slot; and

a spring compressibly positioned around said rod and cylindrical fixed member and between said plate and said housing lower portion normally urging said plate and thereby said rod and actuator member in the upward direction.

4,193,338

GAS DISPERSION SYSTEM

Varis Smiltnieks, 289 The Kingsway, Islington, and Bernard C. Stonehill, 3554 Stonecreek Crescent, Mississauga, both of Ontario, Canada

Filed Oct. 25, 1977, Ser. No. 844,805

Claims priority, application Canada, Oct. 23, 1973, 238328

Int. Cl.[2] F27D *21/00*; F24F *00/00*; G21C *19/20*

U.S. Cl. 98—1 **6 Claims**

1. In combination with a gas dispersion system for dispersing noxious gas released into the atmosphere within a contained ground area to prevent its passing at an unacceptable concentration to a neighbouring ground area to be protected, the system comprising

a plurality of gas sensors distributed along a first base region, the gas sensors being positioned and arranged to intercept the flow of gas from the contained area towards the protected area,

circuit means coupled to the gas sensors for producing a trip signal in accordance with the detection of gas thereby,

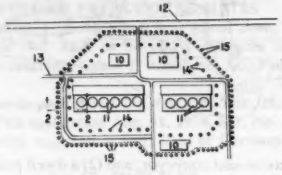
a plurality of burners distributed along a second base region interposed between the first base region and the protected area, the burners being so positioned and arranged so that, when ignited, they produce by thermal convection an air curtain for dispersing the gas upwards,

control means responsive to said trip signal,

fuel supply means for the burners, and

ignition means operable by the control means in response to said trip signal for igniting the burners thereby to produce the air curtain,

display means comprising a console display panel and condition-responsive means for producing thereon a display representative of the current condition of the system, the display panel providing a ground plan of the plant, a first set of indicator lamps located at positions on the panel corresponding to the positions of the gas sensors, a second set of indicator lamps located at positions on the panel corresponding to the positions of the burners, and wind direction and velocity indicating means, said condition-responsive means including means responsive to ignition of the burners for illuminating the second set of indicator lamps, and means responsive to said warning signals for illuminating the first set of indicator lamps selectively in accordance with the detection of gas by the corresponding gas sensors of the corresponding groups.



4,193,339

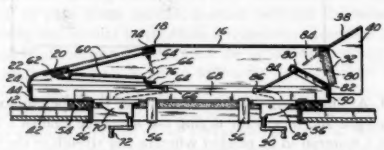
MOTOR VEHICLE VENTILATION DEVICE

William E. Giles, 9782 Central, Garden Grove, Calif. 92644

Filed May 30, 1978, Ser. No. 910,235

Int. Cl.³ B60H *1/26*

U.S. Cl. 98—2.14 **12 Claims**



1. A ventilation device for a motor vehicle roof, comprising:

a body having a top portion and front, rear, and side portions integral with said top portion, said body having an interior for communicating with the interior of said vehicle through a hole in said roof;

a base attached to said body and attachable to said roof around the perimeter of said hole;

an air inlet in said front portion of said body;

air inlet valving means for opening and closing said air inlet and opening into the interior of said body;

first means in the interior of said body for actuating said air inlet valving means;

an air outlet in said rear portion of said body;

air outlet valving means for opening and closing said air outlet, and opening into the interior of said body;

second means in the interior of said body for actuating said air outlet valving means; and

drag-reducing means in said front portion of said body, said drag-reducing means comprising:

a short vertical leading section; and

a sloping section extending downwardly and forwardly from said top portion of said body to said vertical leading section.

4,193,340

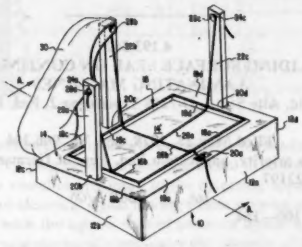
RECEPTACLE FOR BULK COLLECTION OF WASTE PAPER AND THE LIKE

Melvin Finn, 2509 Central Ave., Alexandria, Va. 22302

Filed Jul. 5, 1978, Ser. No. 922,174

Int. Cl.³ B65B *13/18*

U.S. Cl. 100—34 **7 Claims**



1. Apparatus for bulk collection of waste paper, such as newspapers and the like, comprising:

a generally rectangular base portion having a generally planar paper supporting surface, and upstanding ridges on said paper supporting surface forming a generally rectangular frame for generally defining a paper receiving area of lesser size than the total area of the planar paper supporting surface;

a plurality of recesses located in the peripheral portion of the paper supporting surface outside the paper receiving area, wherein each side lof the peripheral portion of the paper supporting surface contains at least one such recess;

a plurality of upright guide members, each located in a corresponding one of said recesses, for retaining stacked papers within said paper receiving area; and

at least one through hole formed in an upper end portion of each of said uprights above the maximum desired paper storage height for receiving an end portion of a paper tying string to be threaded therethrough prior to depositing papers into the collection apparatus.

4,193,341

PRESSES

Harold J. Clements, Canterbury, and Frank Ely, Ashford, both of England, assignors to Modern Precision Engineers & Associates Limited, Ashford, England

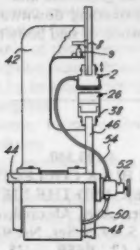
Continuation of Ser. No. 848,191, Nov. 3, 1977, abandoned. This application Apr. 11, 1979, Ser. No. 29,047

Int. Cl.³ B30B *15/34*

U.S. Cl. 100—93 P **10 Claims**

1. A press comprising first and second platens mounted so as to define a working gap therebetween, at least said first platen comprising a housing having a recess defined therein, an inflatable member received within said recess, and a flexible pressure transmitting member having a pressure applying surface for applying pressure upon inflation of said inflatable member,

said pressure transmitting member being retained in the opening of the recess and being mounted so as to be free to adapt to



irregularities in a workpiece over its entire pressure applying surface.

4,193,342

SLIDING SURFACE SEAL ON CONTINUOUS LAMINATING MACHINES

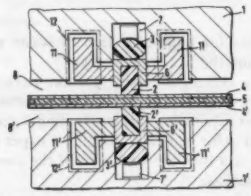
Kurt Held, Alte Str. 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Filed May 15, 1978, Ser. No. 906,344

Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722197

Int. Cl.[2] **B30B** *5/06*

U.S. Cl. 100—154 **6 Claims**



1. A sliding surface seal on a continuous laminating machine comprising: two endlessly rotating bands for placing therebetween an object to be laminated; said rotating bands having backsides away from said object; chamber formed by said bands; said chamber holding fluid means for pressure buildup; sliding seals; pressure plates fastened in said machine by said sliding seals; grooves encircling an edge of said pressure plates; said seals being moved in said grooves by pressure means or by reaction forces issuing from said object to be laminated; said seals being movable outwardly or inwardly relative to said groove; U-shaped holding strips rigidly enclosing said sliding seals; support angles on said holding strips for absorbing thrust acting in a lengthwise direction; recesses on said pressure plates, said recesses emanating from said grooves and corresponding to said holding strips and said support angles on both sides of said groove.

4,193,343

PELLET MARKING APPARATUS WITH FRAME RAISING AND LOWERING MECHANISM

Charles E. Ackley, Sr., Oreland, and Charles E. Ackley, Jr., Philadelphia, both of Pa., assignors to R. W. Hartnett Company, Philadelphia, Pa.

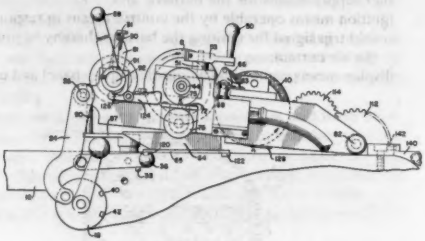
Filed Mar. 29, 1978, Ser. No. 891,292

Int. Cl.[2] **B41F** *17/36*

U.S. Cl. 101—35 **18 Claims**

1. In a pellet marking mechanism of the type having a frame, an ink reservoir mounted on said frame, printing means comprising a design roller and a printing roller both connected to said frame, hopper means into which a multiplicity of pellets or the like are to be loaded, and conveyor means for transporting said pellets from said hopper and presenting them to said printing roller so that the desired indicia are imprinted thereon, the improvement comprising:

(a) pivot means for selectively moving said printing means between (1) an operative position in which said design roller contacts said ink reservoir to receive ink therefrom and in which said printing roller is in position to contact



pellets on said conveyor, and (2) a dwell position in which said design roller is spaced from said ink reservoir and said printing roller is spaced from said conveyor in a position so as not to contact pellets thereon, and

(b) locking means cooperating with said pivot means for securing said printing means in said dwell position when desired.

4,193,344

SILK SCREEN PRINTING MACHINE

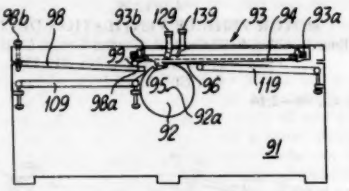
Sylve J. D. Ericsson, Tumba, Sweden, assignor to Svecia Silkscreen Maskiner AB, Norsborg, Sweden

Filed Sep. 28, 1977, Ser. No. 837,425

Claims priority, application Sweden, Sep. 28, 1976, 7610725

Int. Cl.[2] **B05C** *17/06*

U.S. Cl. 101—126 **4 Claims**



1. An improved silk-screen printer of the type employing a squeegee and means for urging the squeegee against a stencil and a material to be printed wherein any stretch in the stencil resulting from the pressure of the squeegee thereon may be compensated for by imparting movement to the stencil relative to the material to be printed, said silk-screen printer comprising:

a stationary platen having a printing surface associated therewith;

a frame spaced from and located above the stationary platen and having a stencil mounted therein, said stencil being comprised of an elastic material;

means for dispensing ink to a surface of said stencil;

a squeegee;

means for urging said squeegee against the stencil so as to provide contact between said stencil and said printing surface; and

said stencil frame being pivotably attached to one end about a shaft with the pivot axis of said stencil frame being located above the horizontal plane of said frame, an oppo-

site end of said frame being capable of movement in a vertical plane so as to allow the frame to pivot about said axis.

4,193,345

DEVICE FOR ADJUSTMENT OF THE INK FLOW ON PRINTING PRESS INKING UNITS

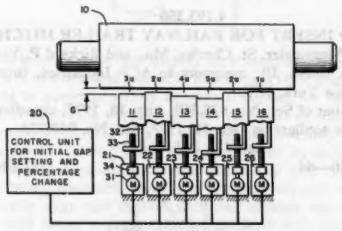
Edgar F. Schoneberger, Selingestadt, and Alfred Dorn, Lammerspiel, both of Fed. Rep. of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 890,934, Mar. 28, 1978, abandoned. This application Aug. 11, 1978, Ser. No. 932,717

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714577

Int. Cl.[2] **B41F** *31/04*

U.S. Cl. 101—365 **16 Claims**



1. In a metering system for metering the rate of ink flow to a printing plate on a column-by-column basis, the combination comprising an ink fountain including a fountain roller, a fountain blade made up of adjacent blade sections individually movable toward and away from the fountain roller to form a gap to adjust the ink film thickness, a miniature reversible electric motor having a step down drive connection drivingly coupled to each blade section, manual switches for initially energizing the motors to establish a respective clearance gap for each blade section to determine the initial ink feed rate to each column position, a linear follow-up potentiometer for each motor and having its slider mechanically coupled thereto, an adjustable voltage supply capable of establishing a reference voltage connection to all of the potentiometers and so that the resulting slider voltage of each potentiometer is a direct measure of the width of the associated initial gap, a voltage memory device for each potentiometer for responding to and storing the value of initial slider voltage, manual means for adjusting the voltage supply so that the voltage supplied to all of the follow-up potentiometers is changed in the same direction and amount to bring about change in the voltages on the various sliders to a new voltage related percentagewise to the initially existing voltage thereon, comparator means responsive to the difference between each initially existing voltage and the new voltage to produce a set of differential voltages, means for applying the differential voltages to the respective electric motors to move the associated sliders to new positions in which each differential voltage is reduced to zero by follow-up action so that all of the blade gaps simultaneously undergo a change to new gap widths related to the respective initial gap widths by the same fixed percentage and means for automatically restoring the voltage supply to the reference level.

4,193,346

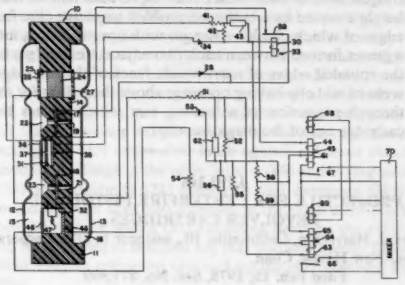
ELECTROLYTIC PRESSURE MECHANISM

Alton D. Anderson, Skokie, Ill., and Nelson N. Estes, Silver Spring, Md., assignors to The Unites States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 16, 1953, Ser. No. 342,762

Int. Cl.[2] **F42B** *21/38, 21/48*

U.S. Cl. 102—18 R **18 Claims**



1. A vessel detecting apparatus comprising means responsive to the time varying negative pressure signal produced by the passage of a vessel in proximity to the detecting apparatus for producing an electrical signal having a time varying amplitude correlative with the square root of pressure signal, means for integrating said electrical signal over the interval of the negative pressure signal duration, and ulitization means responsive to the time integral of said electrical signal.

4,193,347

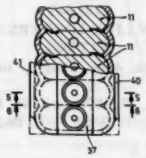
CASELESS AMMUNITION

Otto Stier, and Udo Vollmer, both of Biberach an der Riss, Fed. Rep. of Germany, assignors to Vollmer Werke, Maschinenfabrik GmbH, Biberach an der Riss, Fed. Rep. of Germany

Filed Feb. 15, 1978, Ser. No. 877,871

Int. Cl.[2] **F42B** *5/02, 9/00*

U.S. Cl. 102—38 CC **2 Claims**



1. A magazined ammunition stack for hand firearms for firing caseless ammunition, of the type in which caseless cartridges are delivered out of the magazined ammunition stack into the cartridge chambers of a cartridge holder, consisting of a number of consecutively arranged caseless cartridges in which a bullet is partly surrounded by a charge, and a strip-shaped magazine of elastic plastics material holding the stacked cartridges, having chambers for taking up the cartridges, wherein:

(a) each cartridge comprises a parallelepipedic shaped charge having mutually parallel wider side faces adapted to lie against side faces of adjacent cartridges, each cartridge having a guide groove and a guide tongue which correspond to each other in such a way that the tongue on the side face of one cartridge mates with a corresponding groove of an adjacent cartridge;

(b) the parallelepipedic shaped charge of each cartridge is

provided with an approximately semi-cylindrical round end on its two opposite, parallel side faces;

(c) the parallelepipedic charge of each cartridge has a longitudinal axis recess for holding a bullet, said recess being of a size which corresponds to the calibre of the bullet;

(d) the parallelepipedic shaped charge of the cartridge has rounded off or chamfered outer edges on upper and lower end faces, running into said side faces;

(e) a plurality of contiguously stacked parallelepipedic cartridges have at their bullet ends more than half of their height covered by a U-shaped profiled magazine clip, free edges of which clip have flanges with lips projecting into a gusset formed between each two adjacent cartridges by the rounded edges of narrow side faces of the cartridge, webs of said clip having openings above the bullets for the through-projection of a loading ram which pushes the cartridge out of the magazine clip.

4,193,348

PROJECTILE FOR CENTERFIRE PISTOL AND REVOLVER CARTRIDGES

Henry J. Halverson, Collinsville, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed Feb. 15, 1978, Ser. No. 877,939
Int. Cl.[2] F42B *11/10*
U.S. Cl. 102—91 **10 Claims**

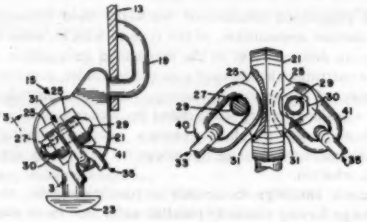
1. A projectile for small arms consisting of a soft metal bullet and a jacket at least partially enclosing said bullet, said jacket being formed of a metal having a hardness of between about 45 and about 60 as measured by the Rockwell R-15T Hardness Test and a shear strength of between about 12,000 and about 24,000 p.s.i.

4,193,349

TIE DOWN CHAIN LINK UNIVERSAL CONNECTOR FITTING

John W. Allen, Sedona, Ariz., assignor to Abex Corporation, New York, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,522
Int. Cl.[2] B25B *25/00*; B60P *7/08*; B61D *3/16, 45/00*
U.S. Cl. 410—7 **2 Claims**



1. A tie-down connector fitting for use in a tie-down assembly including tensioning chains to secure vehicles to the bed of a transporter for shipment, comprising:

a connector body;

attaching means formed on said connector body and removably engageable with said vehicles for securing said connector fitting thereto;

a pair of generally parallel spaced ears disposed on opposite sides of said connector body and extending outwardly therefrom, each pair of said spaced ears having aligning, generally central bores formed therethrough;

an idented radial portion formed in said connector body in between said spaced ears; and,

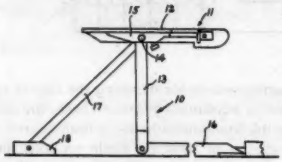
bolts insertable through said aligning central bores of each of said spaced ears, and through an end link of said tensioning chains between said spaced ears adjacent said indented radial portion to secure said end links for rotation and lateral movement about said bolts, said end link of said tensioning chains being movable laterally along said bolts and being pivotal relative to said connector body within said indented radial portion formed therein for substantially reducing the stresses placed on said end links of said tensioning chains during shipment of vehicles to prolong the useful life thereof.

4,193,350

HEAD INSERT FOR RAILWAY TRAILER HITCH

Joseph F. Niggemeier, St. Charles, Mo., and Richard P. Yeates, Downers Grove, Ill., assignors to ACF Industries, Incorporated, New York, N.Y.

Continuation of Ser. No. 825,560, Aug. 18, 1977, abandoned.
This application Oct. 10, 1978, Ser. No. 949,721
Int. Cl.[2] B65J *1/22*
U.S. Cl. 410—64 **12 Claims**



1. In a trailer hitch to be mounted upon a railway flat car having a vertical strut and a diagonal strut in extended position supporting a hitch head adapted to engage and hold in place a kingpin of a trailer supported on said flat car, said hitch including a top plate having an opening including a generally semicircular and vertical kingpin engagement portion, and at least one movable jaw located below said top plate, said jaw being movable between a closed position holding a kingpin captive in said head and adapted to engage said top plate, and an open position allowing said kingpin to be removed, the kingpin applying horizontal loads to said engagement portion in closed position in transit, the improvement comprising:

an insert made of wear resistant and crack resistant material mounted on said top plate within said opening and overlying a substantial portion of the vertical extent of said kingpin engagement portion, said insert forming substantially the only contact between the jaw and the kingpin;

removable fastening means engaging first openings in said insert and second openings in said top plate to hold said insert in place overlying said kingpin engagement portion;

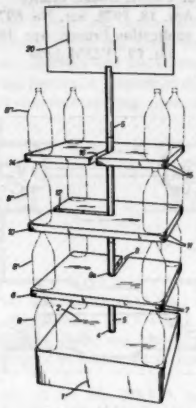
whereby said insert is easily and quickly removable from said top plate by disconnecting said fasteners from said top plate, whereby a new insert may be quickly inserted in place within said opening while said hitch remains in place on said flat car without taking said hitch out of service.

4,193,351

DISPLAY RACK ASSEMBLY

Paul Belokin, Jr., Rte. 4, Hayward, Wis. 54843

Filed Nov. 15, 1978, Ser. No. 960,959
Int. Cl.[2] A47B *57/00*; F16M *13/00*
U.S. Cl. 108—59 **9 Claims**



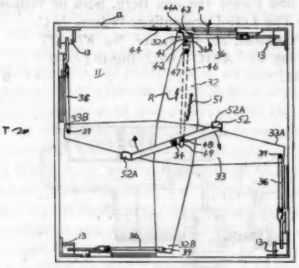
1. A knock-down type display rack assembly for supporting layers of articles, said assembly including a floor engaging base having an upper generally horizontal surface for supporting a layer of articles, a vertical support mounted in and extending upwardly from said base, a plurality of generally horizontal shelves each having a slot extending from its periphery and inwardly to a generally central portion of said shelves, said slots being insertable over said vertical support to thereby vertically align said shelves with one another, the slot of any one shelf being in non-vertical alignment with the slot of an adjacent shelf to thereby prevent all of said shelves from being slid away from said vertical support at any one time by a lateral thrust thereagainst in any one direction, a layer of articles located between adjacent shelves and on which layers the upper adjacent shelf, respectively, is supported.

4,193,352

FOLDING TABLE

Noble M. Hiser, 3019 E. Drachman St., Tucson, Ariz. 85716

Filed Aug. 17, 1978, Ser. No. 934,520
Int. Cl.[2] A47B *3/08*
U.S. Cl. 108—126 **4 Claims**



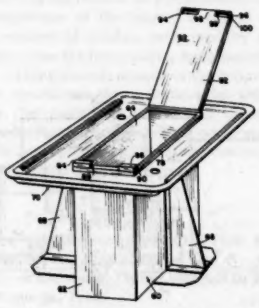
1. A folding table comprising, in combination, a top, a downwardly depending flange extending along the marginal edge of said top, a plurality of legs pivotally mounted on said flange each disposed adjacent a corner of said top for pivotal movement between a folded position and an extended position, a guide element mounted on said flange adjacent each of said legs, a slide member slidably mounted on each of said guide elements, brace means pivotally connecting each of said slide members to the associated leg for sliding movement of said slide member on said guide element during the pivotal movement of said legs between said folded position and said extended position, a pair of cross arms disposed in intersecting arrangement at a central portion of the table through a pivot pin and extending outwardly toward the flanges of said table, plural links one each pinned to an extremity of said cross arms and to each of said slide elements for three of the legs, a single locking member connecting one cross arm extremity to a flange including a pin disposed on said extremity slideably constrained in a slot formed in an extension of said remaining link wherein said pin is connected to the remaining link so that said remaining link can move along the line of said cross arm and said remaining link has formed at the end near the slot a locking lug (**43**) adapted to latch against a keeper (**44***a*) fastened to the flange of the table, an arm (**46**) underlying said one cross arm extremity (**32**) pinned to said extension (**36***a*) and pinned through slots (**49**) disposed in the cross arms (**32,33**) at their juncture, a spring (**51**) extending between the cross arm and the arm (**46**) to bias said lug (**43**) into said keeper (**44***a*) and means (**52**) for retracting said locking lug (**43**) from said keeper (**44***a*).

4,193,353

SECURITY STORAGE BOX

Arthur D. Hinton, and Morris E. Mitchell, both of Fayetteville, Ark., assignors to Steel Security Corporation, Fayetteville, Ark.

Filed Feb. 13, 1978, Ser. No. 877,343
Int. Cl.[2] E05G *1/024, 1/04*; E05C *19/18*
U.S. Cl. 109—50 **13 Claims**



1. A security storage box comprising housing means having at least one side thereof open for providing selective access to the interior thereof, an insulated cover member secured to the housing adjacent said open side and movable between alternate opened and closed positions thereagainst, a locking pin, cooperating apertured sleeve members disposed on the cover member and housing for slidably receiving the locking pin therein, said sleeves being disposed in substantial axial alignment in the closed position of the cover against the open side of the housing whereby the locking pin may be moved longitudinally through the aligned apertures, selective key-pin members adapted for manual insertion within the apertures for controlled movement of the locking pin therein to provide alternate locked and unlocked positions between the sleeves for selective locking and unlocking of the cover member against the open side of the housing, said apertured sleeves comprising a first pair of spaced apertured sleeves, a third sleeve adapted for positioning between the spaced apertured sleeves and in substantially axial alignment therewith in the closed position of the cover member, and wherein the locking pin member is of

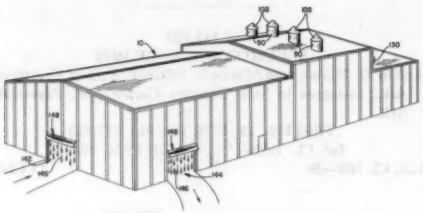
a length substantially equal to the third sleeve whereby positioning of the locking pin entirely within the third sleeve provides said unlocked position and positioning of the locking pin partially in said third sleeve provides said locked position.

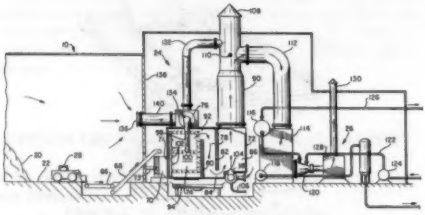
4,193,354

SOLID WASTE DISPOSAL SYSTEM

Maurice G. Woods, P.O. Box 18662, Oklahoma City, Okla. 73118

Filed Oct. 20, 1977, Ser. No. 843,855
Int. Cl.² F23G *5/12*
U.S. Cl. 110—212 **13 Claims**





1. A waste disposal system comprising, in combination:

an incinerator for thermally oxidizing combustible waste material having a primary combustion chamber, a secondary combustion chamber, and passageway means connecting the primary chamber in fluid communication with the secondary chamber, and an exhaust stack connected in fluid communication with the seconardy combustion chamber;

means for injecting a quantity of combustion air into the primary chamber at a pressure greater than atmospheric pressure, the quantity of combustion air being in excess of the amount necessary to support complete thermal oxidation of the waste material; and,

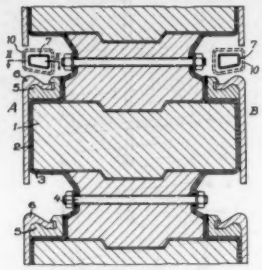
means for evacuating gaseous products of combustion from the primary combustion chamber through the passageway means to the secondary combustion chamber and through the exhaust stack at a rate sufficient to maintain the air pressure inside of the primary combustion chamber at a level which is substantially lower than the atmospheric pressure surrounding the incinerator.

4,193,355

FURNACE WALLS WHICH CAN BE USED AT HIGH TEMPERATURES

Alban Dondeyne, Chatenay Malabry; Maurice Marchasson, Douai; Paul Ravez, Flers-en-Escrebieux, and Louis Soubrier, Douai, all of France, assignors to Houilleres du Bassin du Nord et du Pas de Calais, Douai, France

Filed Apr. 18, 1978, Ser. No. 897,487
Claims priority, application France, Apr. 18, 1977, 77 25313
Int. Cl.² F23M *5/04*
U.S. Cl. 110—336 **8 Claims**



1. A furnace wall for furnaces working at temperatures above 900° C. and having recesses through which pass tubes for the introduction of fluids to be distributed in the furnace, characterized in that it comprises:

a mineral refractory material chosen from amongst ceramic materials and electro-fused materials, the said refractory material forming the load-bearing part of the wall;

a shield of a refractory metallic alloy which lines the surface of the wall with refractory material;

support means for anchoring a shield to said refractory material;

a shield comprising plates of a disposable material resistant to heat and to abrasion and anchorable to the said support means;

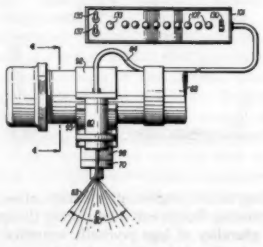
the said wall defining, between the disposable plates, said recesses and tube assemblies in said recesses for the introduction and distribution of fluids, the said tube assemblies consisting of an internal tube and an external tube connected so that the stresses generated on the external tube are not transmitted to the internal tube.

4,193,356

SPRAY MONITORING DEVICE AND IMPLEMENT

Dennis Vehe, and Pieter van den Berg, both of Wilson, N.C., assignors to The Lely Corporation, Wilson, N.C.

Filed Jan. 20, 1978, Ser. No. 871,137
Int. Cl.² A01C *23/02*; B05B *17/00*
U.S. Cl. 111—6 **5 Claims**



1. A spray monitoring device for use on an agricultural

implement that includes at least one fluid sprayer supported by the implement frame, comprising an electrode sensor probe in a housing and means mounting the probe on the implement adjacent a spray outlet and the intended pattern of material to be sprayed, said housing including a dielectric holder for said probe and a cover with an internal flared chamber being a lower open end, said probe being an elongated conductor that is supported by said holder and connectable to an electrical signal having a power source, said probe extending from the holder through said chamber and out of the open end to the edge of the spraying pattern, a substantial distance away from said open end, said chamber tapering upwardly from said open end.

4,193,357

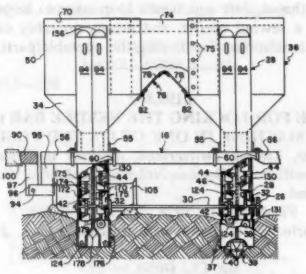
SEED PLANTING MACHINE HAVING SPECIFIC SEED GUIDING STRUCTURE

Carl D. Freeman, Idaho Falls, and Melvin G. Grover, Rigby, both of Id., assignors to Logan Farm Equipment Co., Inc., Idaho Falls, Id.

Continuation-in-part of Ser. No. 676,837, Apr. 10, 1976. This application Nov. 16, 1977, Ser. No. 851,921

Int. Cl.[2] A01C *9/02, 7/20*

U.S. Cl. 111—34 **9 Claims**



1. A machine for setting seeds including a generally vertical circulating planting device having mounted thereon at least one row of seed conveyances and surface providing means associated with said conveyances for embracing and guiding seeds carried on the bottoms of said conveyances and terminating in a seed discharge location at the bottom of the machine, said surface providing means providing a guide path in a first plane that is parallel and proximate to a second plane containing the center line of a furrow in which seeds are to be planted, the axis of circulation of said conveyances on said planting device being substantially perpendicular to said first plane, said conveyances each having an inclined bottom surface the inclination of which is transverse with respect to said guide path, successive seeds in their descent in said planting device to said discharge location being supported on the bottom surfaces of said conveyances and biased by gravity into sliding engagement with said guide path of said surface providing means, the support provided by said conveyances terminating substantially at said discharge location whereby at said discharge location forces transverse to said first plane tending to act on the seed supported by each of said conveyances and guided by said guide path of said surface providing means are minimized and the seed is guided for controlled deposit in a substantially straight line in the furrow.

4,193,358

TUFTING MACHINES

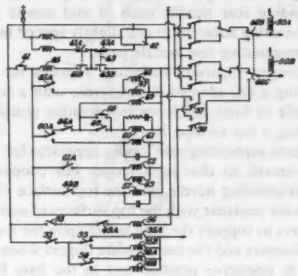
Douglas G. Woodcock, Blackpool, England, assignor to Edgar Pickering (Blackburn) Limited, Blackburn, England

Filed Jul. 31, 1978, Ser. No. 929,780

Claims priority, application United Kingdom, Aug. 5, 1977, 33011/77

Int. Cl.[2] D05C *15/00*

U.S. Cl. 112—79 A **5 Claims**



1. A tufting machine, comprising feed rollers for supplying yarns to the needles of the machine, speed control means for causing the feed rollers to feed the yarns at alternative speeds under control of a patterning mechanism to cause the needles to form pile of different heights in different areas of the fabric to be tufted in accordance with a pattern determined by the patterning mechanism, a tube system which feeds the yarns to the needles to provide repeats of the pattern across the width of the fabric, a border control mechanism including a first counter for counting the number of repetitions of the pattern in a direction lengthwise of the fabric, a second counter for counting the number of strokes performed by the needles, means operative when the first counter has counted a predetermined number of longitudinal repeats of the pattern to free the speed control mechanism from control by the patterning mechanism so that patterning ceases and means operative when the second counter has counted a predetermined number of strokes of the needles to return the speed control mechanism to control by the patterning mechanism.

4,193,359

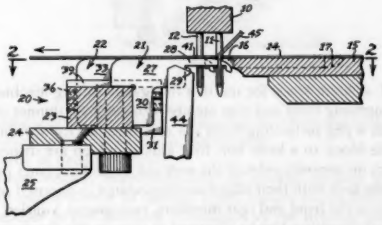
LOW PILE FORMING APPARATUS FOR TUFTING MACHINE

Max M. Beasley, Chattanooga, Tenn., assignor to Tuftco Corporation, Chattanooga, Tenn.

Filed Jun. 23, 1978, Ser. No. 918,482

Int. Cl.[2] D05C *15/00*

U.S. Cl. 112—79 R **4 Claims**



1. In a staggered needle tufting machine having means for supporting the base fabric for longitudinal movement in the feeding direction through said machine, a first row of transversely spaced reciprocal front needles for introducing yarns

through the base fabric to form front loops, a second row of transversely spaced reciprocal rear needles, spaced longitudinally behind, and uniformly staggered relative to, said first row of needles for introducing yarns through the base fabric to form rear loops, a low-pile tufting apparatus comprising:

(a) a needle plate having a plurality of needle plate fingers projecting rearward, each needle plate finger having a top surface,

(b) each of said needle plate fingers being in substantial longitudinal alignment with the reciprocal path of a corresponding rear needle, each of said needle plate fingers terminating adjacent to and slightly spaced in front of said corresponding rear needle path,

(c) a looper apparatus including a looper for each needle having a bill adapted to cooperate with a corresponding needle to form pile loops in operative position, each bill having a top surface, and

(d) means supporting said looper apparatus for reciprocable movement so that each looper bill cooperates with a corresponding needle, and the top surface of said looper bills are coplanar with the top surfaces of said needle plate fingers to support the base fabric upon the top surfaces of the loopers and the needle plate fingers when said loopers are in operative position and as the base fabric moves longitudinally in the feeding direction through the machine.

4,193,360

KNIFE BLOCK ASSEMBLY TUFTING MACHINES

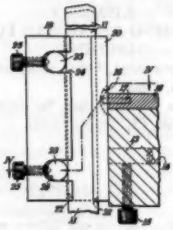
Ernest K. Lund, Accrington, England, assignor to Edgar Pickering (Blackburn) Limited, Lancashire, England

Filed Nov. 24, 1978, Ser. No. 963,579

Claims priority, application United Kingdom, Jan. 9, 1978, 759/78

Int. Cl.[2] D05C *15/00*

U.S. Cl. 112—79 R **2 Claims**



1. A knife block for use in a fine gauge tufting machine and comprising front and rear members joined by a thinner central web, a peg projecting from the rear member for securing the knife block to a knife bar, four knives, which are disposed in pairs on opposite sides of the web and extend in planes parallel to the web with their edges accommodated in opposed pairs of slots in the front and rear members, two spaced, knurled cylindrical clamping blocks disposed in slots in the front member with their axes perpendicular to the planes of the knives and clamping screws, fitted into tapped holes in the front member, which press the clamping blocks into engagement with the edges of the knives.

4,193,361

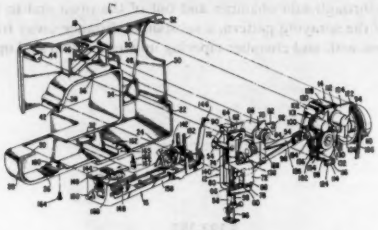
SEWING MACHINE CONSTRUCTION UTILIZING SUBASSEMBLIES

Ralph E. Johnson, Convent Station, N.J., assignor to The Singer Company, New York, N.Y.

Filed Dec. 21, 1978, Ser. No. 971,962

Int. Cl.[2] D05B *73/00, 73/02*

U.S. Cl. 112—259 **6 Claims**



1. In a sewing machine, the combination comprising a sewing machine rear casing section including a plurality of coplanar machined mounting surfaces, a presser and needle bar head end subassembly mounted in an unalterable position in the casing on certain of the said mounting surfaces, a needle bight control subassembly mounted on other of said mounting surfaces, and another subassembly including feed controlling mechanism, a loop taker and fixed throat plate, said another subassembly being adjustably mounted in said casing section to permit the throat plate and needle loop taker to be positioned relative to a sewing needle, and means operably connected with the subassemblies for driving the operable parts thereof.

4,193,362

DEVICE FOR LOCKING THE NEEDLE BAR OF A SEWING MACHINE IN ONE OF ITS END POSITIONS

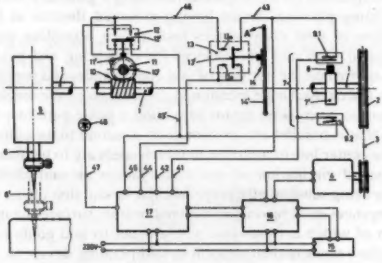
Fritz Glaser, Liestal, Switzerland, assignor to Fritz Gegauf Aktiengesellschaft, Bernina-Nahmaschienfabrik, Steckborn, Switzerland

Filed Dec. 21, 1978, Ser. No. 971,763

Claims priority, application Switzerland, Dec. 27, 1977, 16074/77

Int. Cl.[2] D05B *69/22*

U.S. Cl. 112—275 **1 Claim**



1. A device for locking the needle bar of a motor-driven sewing machine for making functional and ornamental stitches in its upper or lower end position, comprising first and second pulse transmitters for respectively signaling the upper and the lower end positions of the needle bar, a control system for actuating the drive motor of the sewing machine, means for selecting the kind of functional or ornamental stitch to be made by the sewing machine, and means mechanically controlled by the needle bar drive for monitoring the position of the end of

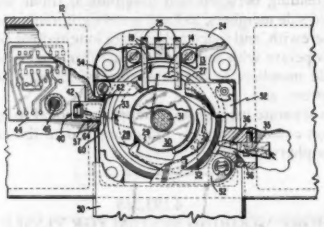
an ornamental stitch pattern in relation to a point of reference of the ornamental stitch pattern, the device comprising a first reversing switch having a movable contact member which is adapted to be brought into either of two switch positions by a control element of said means for monitoring the ornamental stitch pattern in order to transmit, in the first switch position, the position signal of the second pulse transmitter to said control system and, in the second switch position, to close a break contact in the electric circuit for actuating an indicator means adapted to signal the approach of the end of an ornamental stitch pattern, and the device also comprising a second reversing switch having a movable contact member which is adapted to be brought into either of two switch positions by a control element of the stitch-selecting means, the first of said switch positions being assigned to the functional stitch and the second to the kinds of ornamental stitch in order to transmit the position signal of the first pulse transmitter to said control system in the first switch position, and in order to apply the supply voltage to the break contact in said first reversing switch in the second switch position for actuating said indicator means when said stitch-selecting means is connected for making ornamental stitches.

4,193,363

LINT MINIMIZATION IN SEWING MACHINE BOBBIN ALARM

Howard L. Beckerman, Red Bank, and Allan M. Dob, Clifton, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Apr. 19, 1979, Ser. No. 31,675
Int. Cl.[2] D05B *51/00*
U.S. Cl. 112—278 **1 Claim**



1. A sewing machine having a frame including a bed portion, said bed portion having a cavity for receiving a looptaker, a looptaker rotatably supported in said cavity, a bobbin case supported in said looptaker against rotation therewith, said bobbin case freely supporting a lower thread carrying bobbin therein, means for sensing the thread carrying condition of said bobbin, said sensing means including a light source and a light detector, wherein the improvement comprises:

means for enclosing said light source and extending a lens portion thereof into said looptaker cavity; and

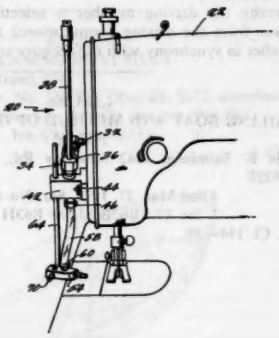
means for encasing said light detector with a portion thereof extending into said cavity, said portion being formed on a surface adjacent said looptaker with an edge of said surface facing upstream relative to the windage generated by said looptaker and extending close to said looptaker and with said adjacent surface tapering away from said looptaker to a trailing edge facing downstream relative to said upstream edge, said adjacent surface being formed with an orifice for passage of rays from said light source to said light detector.

4,193,364

NEEDLE COOLER

Owen F. Dunne, Tiverton, R.I., assignor to Clevepak Corporation, White Plains, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,546
Int. Cl.[2] D05B *71/00, 51/00, 81/00*
U.S. Cl. 112—281 **4 Claims**



1. A needle cooler for a sewing machine comprising:

a vortex tube having an inlet for connection to a source of pressurized gas, a cold air outlet and a hot air outlet;

a block mounting said tube having a bore extending therethrough from an inlet coupled to said cold air outlet to a block outlet, said block including means for mounting said cooler on a sewing machine;

a nozzle for directing cold air onto a sewing machine needle;

a flexible tube connecting said block outlet to said nozzle; and

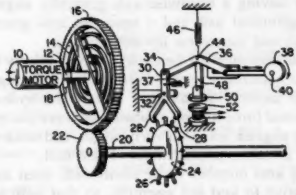
a manually adjustable positioning rod extending between said block and said nozzle for positioning and holding said nozzle in an orientation so that said nozzle directs said cold air onto said needle.

4,193,365

TOGGLE CONTROLLED SERVO SYSTEM

Hubert Blessing, Dallas, Tex., assignor to Levi Strauss & Co., San Francisco, Calif.

Filed Dec. 4, 1978, Ser. No. 966,195
Int. Cl.[2] F16H *21/26, 33/00*; D05B *21/00, 27/14*
U.S. Cl. 112—314 **9 Claims**



6. Apparatus for selectively translating reciprocating motion into intermittent rotary motion, comprising

a source of driving torque,

a torsion member interconnecting the driving member with the torque source to thereby apply torque to the driving member in the direction of rotation of the driving member,

reciprocatably operating escapement means for controlling rotation of the driving member,

a two-ended toggle linkage connected at one end in an operating relationship with the escapement means, the

toggle linkage having a normally flexible knee joint between the two ends, means for supplying a constantly reciprocating driving force to the other end of the toggle linkage, and means for selectively locking the knee joint so that the driving force is transmitted to trigger the escapement means when the knee joint is locked and is diverted into flexing the knee joint when the knee joint is unlocked,

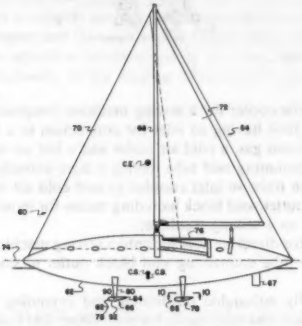
whereby the driving member is selectively rotated under power from the driving torque source through the torsion member in synchrony with the reciprocating driving force.

4,193,366

SAILING BOAT AND METHOD OF OPERATING THE SAME

Reijo K. Salminen, 1842 Academy Rd., Bellingham, Wash. 98225

Filed Mar. 27, 1978, Ser. No. 890,363
Int. Cl.[2] B63B *35/00*; B63H *9/00*
U.S. Cl. 114—39 **17 Claims**



1. A sailboat comprising:

a. a displacement hull having front and rear ends, a longitudinal axis, a transverse horizontal axis and a vertical axis,

b. a sail assembly mounted to said hull and arranged to be able to be positioned relative to wind which is blowing at an angle to the longitudinal axis of the hull so that the sail develops an aerodynamic force within a predetermined force range, said aerodynamic force having a lateral aerodynamic force component and a forward aerodynamic force component,

c. a keel member mounted beneath said hull, said keel member having a cordwise axis generally aligned with said longitudinal axis and a spanwise axis generally aligned with said transverse horizontal axis,

d. said keel member being hydrodynamically contoured so that with the boat moving forwardly through water, said keel member produces a downward hydrodynamically created force having a substantial force component generally aligned with said vertical axis, and tending to increase the effective displacement of said hull,

e. said keel member being positioned, sized and contoured relative to said sail assembly, so that with said boat in a heeled position and travelling forwardly with a small yaw angle, said keel member develops a downwardly and laterally direct keel force with both vertical and lateral keel force components, said keel force being of a magnitude that the lateral keel force component substantially counteracts the lateral aerodynamic force component,

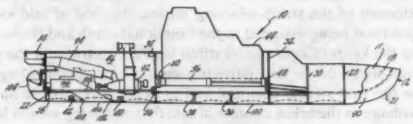
whereby with said boat travelling with its longitudinal axis at an angle to the wind, said keel member is able to generate its hydrodynamic force simply by virtue of forward movement of the boat, without necessity of the boat travelling at a substantial yaw angle, with the result that the hydrodynamic lateral force component is able to substantially counteract the lateral aerodynamic force component in a manner to substantially diminish yaw angle in the forward travel of the boat.

4,193,367

BOAT DESIGNED TO WITHSTAND THE FORCE OF UNDERWATER EXPLOSIONS

John J. Benincasa, Rockville, and Marvin L. Hage, Avon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 17, 1969, Ser. No. 816,934
Int. Cl.[2] B63B *43/18*, *43/00*
U.S. Cl. 114—68 **17 Claims**



1. A marine vessel having a hull with a capability of withstanding the force of underwater explosions and having a bow, a stern, a bottom, and a longitudinal centerline and including:

(A) side members having top and bottom edges and abutting at said bow to form a watertight joint and extending to the stern and positioned substantially symmetrically on opposite sides of the longitudinal centerline of of the ship,

(B) a transom having top and bottom edges and located at the stern and extending transversally between and connected to the aft end of said side members to form a watertight joint therewith,

(C) at least one longitudinal frame member extending along the longitudinal centerline of the ship between said bow and said stern and connected to the bottom edge of said side members at said bow and connected to the bottom edge of said transom,

(D) a plurality of transversally extending support members extending between said longitudinal frame member and said side members, to form watertight joints and the chine therewith, and spaced along said longitudinal centerline to cooperate with said longitudinal frame member and said side members to define a plurality of bays in the boat bottom, and

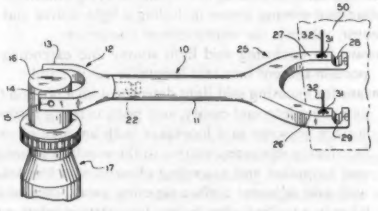
(E) a separate membrane member individual to each of said bays extending across and connected to the entire outer periphery thereof.

4,193,368

OFFSHORE MOORING SYSTEM FOR VESSEL OR SHIP

Douglas W. DeGraaf, Addison, and William A. Tam, Warrenville, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jan. 20, 1978, Ser. No. 870,993
Int. Cl.[2] B63B *21/52*
U.S. Cl. 114—230 **20 Claims**



1. A quick-release mooring apparatus for a floating vessel comprising:

a substantially stationary means anchored to the sea floor and projecting above sea level,

a vessel mooring member attached at a first end above sea level to the stationary means in a manner which permits the mooring member to rotate about vertical and horizontal axes passing through the point of attachment to the stationary means,

the second end of the mooring member comprising a vessel mooring yoke having a pair of spaced arms, one end of each of which is adapted to be releasably attached, by lifting the vessel mooring yoke, to opposite sides of the bow of a vessel for rotation about a horizontal axis,

each arm containing a pocket open at the top in which a trunnion mounted on the vessel can mate when the vessel mooring yoke is lifted into releasable engageable contact therewith, and

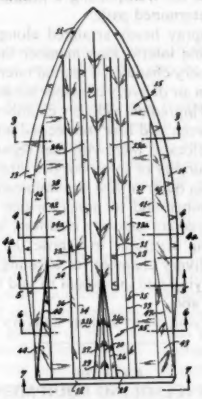
the mooring member having sufficient buoyancy for the second end to float on the sea when unconnected to a vessel.

4,193,369

HIGH SPEED BOAT HULL

Carlos Talamantes, Jr., 9915 S. Greenleaf, Santa Fe Springs, Calif. 90670

Filed Apr. 24, 1978, Ser. No. 899,180
Int. Cl.[2] B63B *1/00*
U.S. Cl. 114—290 **10 Claims**



1. A boat hull having a stern and bow and being symmetrical about a center line and having a midship section defined as the largest transverse section, said hull comprising:

a keel portion having a pair of first surfaces forming a V-shape and disposed longitudinally from the stern to the bow;

longitudinally and substantially horizontal outboard second surfaces spaced transversely on opposite sides of said keel portion;

at any transverse plane through the hull, the lines of intersection of each of said second surfaces and said respective plane being horizontal, and the lines of intersection of said keel portion and said respective plane being V-shape and having the point of said respective V-shape line disposed lower than the first named lines of said intersection;

a pair of upwardly arched tunnels connecting said keel portion with each one of said respective second surfaces;

each of said tunnels having a substantially horizontal third surface and a substantially vertically disposed inboard fourth surface which connects to the keel portion, and also having a substantially vertically disposed outboard fifth surface which connects to a respective one of said second surfaces from a first region lying between aft of the bow and forward of the midship section to a second region aft of the midship section, said vertically disposed fourth and fifth surfaces being substantially parallel to each other;

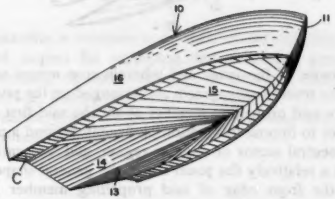
each of said tunnels having an outboard flat inclined sixth surface disposed at an incline and extending longitudinally from said second region to the stern and connecting said horizontal third surface to said respective horizontal second surface.

4,193,370

PLANING BOAT HULL

Harry L. Schoell, Miami, Fla.

Continuation of Ser. No. 779,752, Mar. 21, 1977, abandoned.
This application Sep. 8, 1978, Ser. No. 940,933
Int. Cl.[2] B63B *1/18*
U.S. Cl. 114—291 **1 Claim**



1. In a planing boat hull having a bow portion, a stern portion, an upper hull portion, a lower hull portion and a keel extending between said bow portion and said stern portion, a chine portion joining said upper hull portion and said lower hull portion and extending the length of said hull, said lower hull portion having an arcuate portion at the bow formed from a segment of a cone extending on either side of said keel from said bow portion and toward said stern portion and a substantially flat and coplanar portion extending upwardly from 12° to 18° from the horizontal on either side of said keel from said arcuate portion to said stern portion, said keel lying substantially horizontally from said stern portion to substantially two-thirds of the length of said boat hull, said flat portion of said lower hull portion bordering on said horizontal portion of said keel and the remainder of said keel extending along said arcuate portion of said lower hull portion, said chine portions each having a substantially horizontal portion extending outwardly from the edges of said lower hull portion and a chine lip portion extending the length of the chine portions and extending downwardly from said horizontal portion and in a reverse direction from said flat portion of said lower hull portion at substantially 12 to 18 degrees from the horizontal.

4,193,371

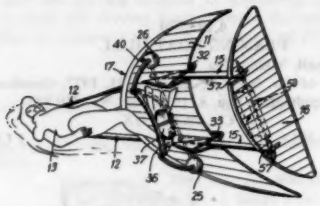
DOUBLE-ACTING SINGLE-WEB SWIMMING APPARATUS

Raymond G. Baulard-Caugan, Résidence Dauphine Pavillon du Barry, Louveciennes, France (78430)

Filed Oct. 5, 1977, Ser. No. 839,501
Claims priority, application France, Oct. 5, 1976, 76 29926
Int. Cl.[2] B63H *16/00*
U.S. Cl. 115—22.2 **13 Claims**

1. An apparatus for the self-propulsion of swimmers of the type comprising an anti-drift member, a harness set connected to the said anti-drift member and adapted to be passed round the body of the said swimmer, and at least one propelling fishtail member connected to the said anti-drift member through a transmission system so mounted as to perform a swinging or oscillating motion with respect to the said anti-drift member and actuated by the swimmer, wherein said transmission system comprises a rigid, substantially rectangular frame, one of the sides of which is constituted by a first pivot-bar substantially parallel to the main medial plane of said anti-drift member, the frame side opposite to said first pivot bar

constituting a second pivot bar about which said frame pivots with respect to said anti-drift member and wherein said second pivot bar is arranged in the main medial plane of said anti-drift member and is pivotally connected to the latter by two substantially spherical joint-balls incorporated in the thickness of said anti-drift member, wherein said propelling member is arranged to substantially freely pivot about the said first pivot



bar lengthwise of the latter and wherein stop means are secured to the transmission system and arranged on the pivoting path of the said propelling member about the said first pivot bar in order to oppose its rotation preferably beyond a predetermined neutral sector or angular region; and said anti-drift member is a relatively flat panel cut in the general shape of a crescent; the front edge of said propelling member being curved.

4,193,372

APPARATUS FOR WAXING A YARN

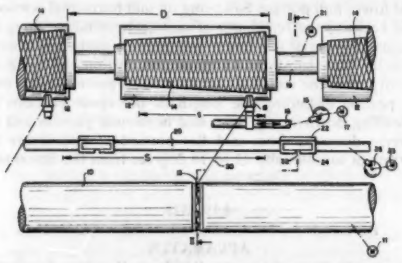
Heinrich Eckholt, Münster, Fed. Rep. of Germany, assignor to Hamel GmbH Zwirnmaschinen, Münster, Fed. Rep. of Germany

Filed Feb. 17, 1978, Ser. No. 878,885

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2707044

Int. Cl.[2] **D06M** *13/02;* **B05C** *1/06*

U.S. Cl. 118—713 **13 Claims**



9. An apparatus for waxing a yarn, said apparatus comprising:

means for feeding said yarn along a yarn path between an upstream feed location and a downstream feed location and through a treatment location between said feed locations;

an elongated bar extending through said treatment location and through a waxing station and having a surface displaceable between a position at said treatment location and a position spaced from said treatment location and at said waxing station;

means for applying wax to said surface in said waxing station; and

means for periodically longitudinally reciprocating said surface between said waxing station and said treatment location and transferring the wax applied in said station to said surface to said yarn in said treatment location.

4,193,373

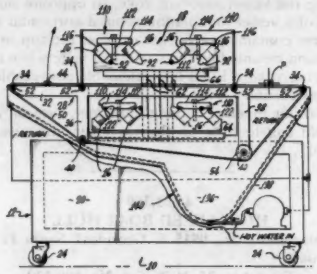
SPRAY APPARATUS FOR APPLYING INGREDIENT COATINGS TO FOOD PRODUCTS

Harold W. Hanson, Jr., Newport Beach, and Beuford C. Doering, Costa Mesa, both of Calif., assignors to Par-Way Co., Los Angeles, Calif.

Filed Jan. 20, 1978, Ser. No. 870,937

Int. Cl.[2] **B05C** *5/00*

U.S. Cl. 118—17 **24 Claims**



1. A spray apparatus comprising:

conveyor means for transporting a product to be sprayed along a predetermined path;

a plurality of spray heads arranged along said path each including a first interlocking member that defines an ingredient delivery chamber, a second interlocking member that defines an air delivery chamber substantially coextensive with said ingredient delivery chamber, a divider plate disposed between said first and second interlocking members and interlocked therewith that separates said chambers, and a plurality of spray nozzles directed at said path each having an outer orifice communicating with said air delivery chamber and an inner orifice communicating with said ingredient delivery chamber, said interlocking members being separable to expose the interior of said ingredient delivery chamber for cleaning;

means for supplying said ingredient to said ingredient delivery chamber; and

means for supplying air to said air delivery chamber.

4,193,374

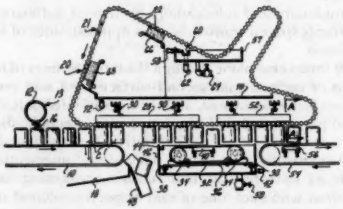
CAN HANDLING EQUIPMENT

Rohinton M. Mirza, Union City, N.J., assignor to Metalwash Machinery Corporation, Elizabeth, N.J.

Filed Jul. 17, 1978, Ser. No. 925,491

Int. Cl.[2] **B05C** *9/12, 11/02*

U.S. Cl. 118—58 **16 Claims**



1. Can handling equipment comprising a coating station at which a coating is applied to can bodies, a drying station at which said coating is dried, an overhead transfer conveyor for transferring can bodies from said coating station to said drying station, an excess coating removal station disposed between

said coating and drying stations and comprising a receptacle for containing a coating solvent, an endless belt conveyor having an upper, can carrying course, disposed within said receptacle at a level such that the lower portions of can bodies supported thereon are dipped below the level of said solvent and means causing can bodies to fall from said overhead transfer conveyor to said endless belt conveyor and to be returned from said endless belt conveyor to said overhead transfer conveyor.

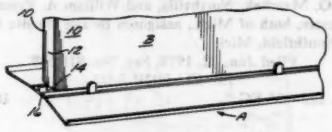
2. Equipment as claimed in claim 1 wherein means causing said cans to be carried by said overhead transfer conveyor are magnetic means.

4,193,375

FLOOR PROTECTING DOOR PAINTING SHIELD

Stanley G. Sharland, Garden Grove, and Angelo R. Mecca, Costa Mesa, both of Calif., assignors to Douglas M. Lightfoot

Filed May 30, 1978, Ser. No. 910,676
Int. Cl.[2] B05C *21/00*
U.S. Cl. 118—504 **4 Claims**



1. A floor protecting door painting shield for use with a pivotally supported wood door that may be pivoted during a painting operation thereon that includes:

a. an elongate member formed of a resilient sheet and of a length at least as great as the width of the door that is to be painted, said elongate member having a transverse cross-section that includes a substantially flat center portion that is of a width at least as great as the thickness of said door, two arms of substantial length that extend downward and outwardly in opposite directions from opposite sides of said center portion at such an angle that when the shield is disposed under a door and the outer edges of said arms are in contact with the floor under said door, said center portion is forced upwardly due to the resiliency of said arms towards pressure contact with the under edge surface of said door, and a pair of lips that extend upwardly from the outer longitudinal edges of said arms to prevent paint spilled on the upper surface of said arms flowing therefrom onto said floor; and

b. first means that extend upwardly from said elongate member to removably engage said door and prevent said elongate member from being disengaged from said door when said door is pivoted relative to said floor during the painting of said door.

4,193,376

DEVELOPER POWDER SUPPLY IN MAGNET BRUSH DEVELOPMENT

Hiroshi Hamaguchi, Sakai, and Tadaaki Kawano, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

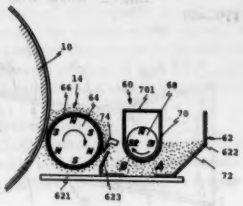
Filed Nov. 23, 1977, Ser. No. 854,212
Claims priority, application Japan, Nov. 29, 1976, 51/145454
Int. Cl.[2] G03G *13/09*
U.S. Cl. 118—658 **6 Claims**

1. In an electrophotographic copying machine wherein an image from a subject sheet is developed by a developing system through the use of developer powder contained in a developer powder reservoir, said developing system comprising:

a magnet brush developing roller for developing said image; and

a developer powder supplier disposed within said developer powder reservoir for supplying the developer powder to said magnet brush developing roller and for stirring said developer powder within the developer powder reservoir, said developer powder supplier including:

a rotatable cylindrical magnet for generating a non-uniform magnetic field therearound and including a surface portion of said rotatable cylindrical magnet which essentially does not have a magnetic field and said portion being



rotatable in response to rotation of said rotatable cylindrical magnet for supplying said developer powder in a swinging movement causing the stirring of said developer powder within said reservoir; and

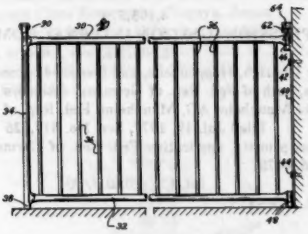
a stationary non-magnetic sleeve enclosing said rotatable cylindrical magnet.

4,193,377

PANEL STRUCTURE FOR ANIMAL PENS

Levon R. Weldy, 911 E. Waterford St., Wakarusa, Ind. 46573

Filed Jun. 2, 1978, Ser. No. 912,102
Int. Cl.[2] A01K *1/02*
U.S. Cl. 119—20 **10 Claims**



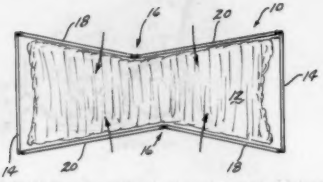
1. A panel structure for animal pens, comprising a panel, a stem connected to one end of the panel near the top thereof and extending downwardly, a stem connected to said one end of the panel near the bottom thereof and extending downwardly, a supporting member adapted to be disposed at said one end of the panel, a fixture mounted on said member near the top of the panel and having a vertical opening therethrough for receiving said first mentioned stem, a fixture mounted on said member near the bottom of the panel and having a vertical opening for receiving the lower stem on the respective end of the panel, a bracket mounted on said member and disposed above one of said fixtures, an elongated element pivoted to said bracket and movable automatically by gravity from a substantially horizontal position to a lowered vertical position above one of the stems on said panel for preventing the lifting of said panel relative to said support member and preventing the removal of said stems from the openings in said fixtures.

4,193,378

FEEDER FOR HAY BALES AND STACKS

Richard L. Harden, R.R. 1, Lineville, Iowa 50147

Continuation of Ser. No. 709,862, Jul. 29, 1976, Pat. No. 4,089,301. This application Oct. 27, 1977, Ser. No. 845,872
The portion of the term of this patent subsequent to May 16, 1995, has been disclaimed.
Int. Cl.[2] A01K *5/00*
U.S. Cl. 119—60 **6 Claims**



1. An animal adjustable hay feeder comprising an endless enclosure including six pivotally interconnected sections movable in response to feeding animals between a rectangular shape to a pair of triangular shapes,

said enclosure having opposite end sections and oppositely disposed sides with each side having a pair of sections,

each pair of side sections include a long and a short section, with the difference in length between said long and short sections being substantially greater than the thickness of said end sections,

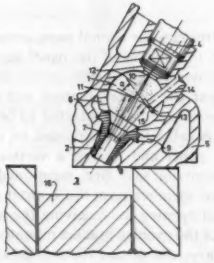
said long sections in said opposite sides being diagonally disposed and said short sections in said opposite sides being diagonally disposed whereby upon said sides being moved towards each other said long sections move into overlapping closely adjacent parallel planes and said short sections move into spaced apart parallel planes thereby forming a pair of spaced apart triangular shaped feeding enclosures.

4,193,379

COMPRESSION-IGNITION INTERNAL COMBUSTION ENGINE

Werner Dietrich, Heppenheim, and Oswald Hiemesch, Lampertheim, both of Fed. Rep. of Germany, assignors to Motoren-Werke Mannheim AG, Mannheim, Fed. Rep. of Germany

Filed Jul. 19, 1977, Ser. No. 817,526
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634470
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 C **9 Claims**



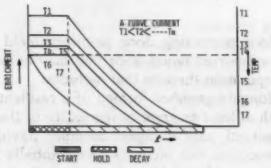
1. A compression-ignition internal combustion engine comprising: at least one combustion cylinder; a piston reciprocably arranged in the cylinder; a mixing chamber; said mixing chamber is axially symmetrical; a duct permanently communicating the cylinder with the mixing chamber; means for injecting fuel into the mixing chamber during compression of combustion air in the cylinder, the fuel being injected in a direction toward the duct and having the form of a narrow core jet surrounded by fine droplets, said duct and said core jet are each coaxial with said mixing chamber such that combustion air displaced into the mixing chamber during the compression flows countercurrently to the core jet; and turbulence-producing means disposed within the chamber in the path of the inflowing displaced air and located so as to be outside of the core jet, producing means, being further defined by a body which is formed with an end face having a thickness of from 15 to 35% of the largest cross section of said chamber normal to the axis thereof on which inflowing air impinges and which lies in the region of a plane normal to the axis of said chamber and passing through the center of said chamber, said end face being formed with a sharp-edged boundary so as to increase the intensity of mixing of the fuel and air.

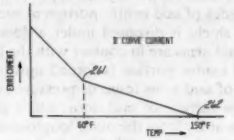
4,193,380

START AND WARM UP FEATURES FOR ELECTRONIC FUEL MANAGEMENT SYSTEMS

Roman O. Marchak, Northville, and William A. Peterson, Jr., Rochester, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jun. 22, 1978, Ser. No. 918,309
Int. Cl.[2] F02B *3/02*
U.S. Cl. 123—32 EG **10 Claims**





1. An electronic control unit for the management of the air/fuel ratio of an internal combustion engine, said electronic control unit comprising:

base calibration means for regulating the air/fuel ratio of the engine in response to sensed engine operating parameters indicative of the mass air flow and mass fuel flow inducted into the engine, said base calibration means regulating the air/fuel ratio by sensing one of said mass air flow and said mass fuel flow and calculating the other from a schedule of desired air/fuel ratios;

warm up means correcting said base calibration means for enriching the air/fuel ratio during warm up periods of the internal combustion engine, including:

a first warm up current generator means for generating a first warm up current proportional to the desired warm up enrichment which is time and temperature dependent, said first warm up current having a temperature dependent holding level current which remains constant for a predetermined duration, said first warm up current decaying to a minimum value from said holding level after the predetermining duration of the holding level has ended; and

a second warm up current generator means for generating a second warm up current proportional to the desired warm up enrichment which is an inverse function of temperature, wherein said first and second warm up currents are

combined to generate a total warm up current for correcting said base calibration means; and

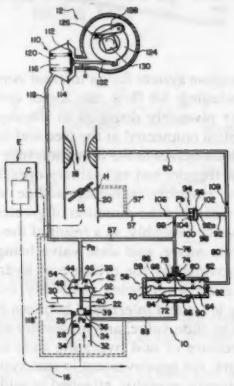
load enrichment means for varying said total warm up current signal as a linear function of the load of said internal combustion engine; said load enrichment means increasing said enrichment for increasing loads after a predetermined load is attained up to a maximum enrichment at full loads.

4,193,381

SPARK ADVANCE CONTROL DEVICE FOR ENGINE EQUIPPED WITH EGR SYSTEM

Syunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 17, 1977, Ser. No. 852,533
Claims priority, application Japan, Nov. 19, 1976, 51/139872
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **8 Claims**



1. In an internal combustion engine including a combustion chamber, an intake passageway providing communication between the atmosphere and the combustion chamber, a venturi formed in the intake passageway, a throttle valve rotatably disposed in the intake passageway downstream of the venturi, and an exhaust gas passageway providing communication between the combustion chamber and the atmosphere, the improvement comprising:

means defining an EGR passageway providing communication between the exhaust gas passageway and the intake passageway for recirculating exhaust gas back to the combustion chamber;

a diaphragm actuated EGR control valve operatively disposed in said EGR passageway to divide said EGR passageway into an upstream portion connecting to the exhaust gas passageway and a downstream portion connecting to the intake passageway, said EGR control valve being operative to change the pressure of the exhaust gas in the upstream portion of said EGR passageway to control the flow of the recirculated exhaust gas, the diaphragm of said EGR control valve defining a first chamber which communicates through means defining a first passage with the intake passageway to provide the first chamber with an intake vacuum in the intake passageway;

control means for controlling the intake vacuum to be provided to the first chamber of said EGR control valve to change the exhaust gas pressure in the upstream portion of said EGR passageway in accordance with the exhaust gas pressure in the upstream portion of said EGR passageway and in accordance with venturi vacuum generated at the venturi in the intake passageway,

said control means including

means defining a second passage connecting to said first passage and having an inlet port communicating with the atmosphere for bleeding atmospheric air into said second passage to dilute the vacuum in said first chamber,

a pressure regulating valve located with a head movable relative to said inlet port of said second passage for controlling the flow of atmospheric air bled through said inlet port into said second passage, and

operating means operatively connected to said pressure regulating valve such that said pressure regulating valve changes the bleed of atmospheric air through said inlet port in response to the change in the vacuum at said venturi and in response to the change in the exhaust gas pressure in the upstream portion of said EGR passageway to change the dilution of the intake vacuum provided to said first chamber,

said operating means including

a first flexible diaphragm defining a second chamber communicating with said venturi through means defining a third passage to receive said venturi vacuum therefrom, and

a second flexible diaphragm defining a third chamber communicating with the upstream portion of EGR passageway to receive the exhaust gas pressure therefrom, said second flexible diaphragm being fixedly connected to said first diaphragm, said first and second diaphragms being operatively connected to said pressure regulating valve such that said pressure regulating valve is operated to change the flow of atmospheric air through said inlet port in response to the change in the venturi vacuum provided in said second chamber and in response to the change in the exhaust gas pressure provided in said third chamber; and

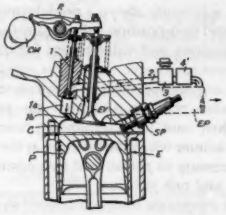
means for controlling the spark timing of a spark plug disposed in the combustion chamber in accordance with intake vacuum to be provided to the first chamber of said EGR control valve.

4,193,382

STRATIFIED CHARGE TYPE COMBUSTION PROCESS FOR INTERNAL COMBUSTION ENGINE AND INTERNAL COMBUSTION ENGINE UTILIZING SAME

Yujiro Oshima, Ichinomiya, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan

Filed Mar. 19, 1976, Ser. No. 668,552
Claims priority, application Japan, Mar. 19, 1975, 50-33912
Int. Cl.[2] F02M *25/06;* **F02B** *17/00*
U.S. Cl. 123—119 A **62 Claims**



1. A stratified charge type combustion process for an overhead valve type of an internal combustion engine, wherein an inflammable mixture of air and fuel supplied into a combustion chamber of said internal combustion engine is ignited and burned, comprising the steps of

supplying an inflammable mixture into a peripheral portion of a combustion chamber during an intake stroke in order to make said inflammable mixture stay in said peripheral portion of said combustion chamber,

supplying exhaust gases into a central portion of said combustion chamber during said intake stroke, independently of said inflammable mixture, in order to make said exhaust gases stay in said central portion of said combustion cham-

ber without diffusing throughout said combustion chamber,

forming a region containing a high concentration of exhaust gases in said central portion of said combustion chamber and another region containing said inflammable mixture charge in a manner to encompass said region therewith within said combustion chamber during a compression stroke of said engine,

thereby providing stratified charges of said one region of said exhaust gases and another region of inflammable mixture charge, and igniting said inflammable mixture charge by ignition means and burning said stratified charges of said exhaust gases and inflammable mixture charge so as to make the combustion proceed from the peripheral portion of said combustion chamber to the central portion thereof.

4,193,383

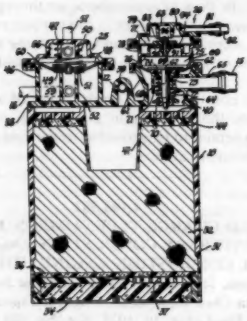
VACUUM OPERATED VALVE ARRANGEMENT

David W. Rogers, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 27, 1978, Ser. No. 928,381

Int. Cl.[2] F02M *59/00*; F16K *31/365*; B01D *50/00*

U.S. Cl. 123—136 **9 Claims**



1. In a vacuum operated valve arrangement the combination of a two-position valve movable between two positions, a spring urging said two-position valve toward one of said positions, vacuum responsive means responsive to vacuum from a source at a pressure above a predetermined negative pressure to move said two-position valve against said spring to the other of said positions, and valve means for trapping the vacuum at said vacuum responsive means at a pressure above said predetermined negative pressure to maintain said two-position valve in said other position whenever the pressure at the source drops below said predetermined pressure but releasing the trapped vacuum when the pressure at the source reaches atmospheric pressure to permit said two-position valve to be spring biased to said one position.

5. In an evaporate emission control system for a fuel system of an internal combustion engine, fuel vapor storage means for collecting and storing fuel vapor for later burning in the engine, vapor vent valve means normally biased to open to permit venting of fuel vapor from the fuel system to said storage means when the engine is not running and responsive to engine vacuum only above a predetermined negative pressure to close to prevent such venting when the engine is running, and vacuum trap-release valve means for trapping vacuum at said vent valve means at a pressure above said predetermined negative pressure whenever engine vacuum drops below said predetermined negative pressure to thereby maintain venting prevention during engine running at lower engine vacuum and releasing the trapped vacuum to thereby permit venting when the engine is not running.

4,193,384

FUEL INJECTION SYSTEM

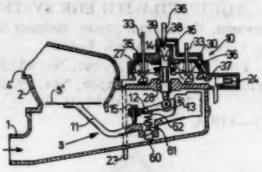
Josef Steiner, Esslingen, and Friedbert Michel, Kornwestheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,737

Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621555

Int. Cl.[2] F02M *1/10*

U.S. Cl. 123—179 L **4 Claims**



1. A fuel injection system for an internal combustion engine, said system including: air flow rate meter comprising a main operating lever pivotably disposed in the engine's induction tube, a baffle plate connected at the free end of the main operating lever, which moves in the induction tube under the influence of air flow therein, and an auxiliary operating lever; a fuel metering valve assembly including a slide valve, said slide valve being actuated, in the direction of greater opening of the fuel metering valve assembly, as a result of the displacement of said air flow rate meter, said slide valve being subjected to a return force provided by the pressure of hydraulic fluid; said auxiliary operating lever being pivotably connected to the main operating lever and interposed between the main operating lever and the slide valve; and a pressure control valve for altering the pressure of said hydraulic fluid according to engine temperature, the improvement in said system comprising:

an electromagnetic acutator, attached to said main operating lever, said actuator including a movable armature and a spring secured thereon for displacing said slide valve in the direction of greater opening, said spring being so dimensioned that it displaces said slide valve, during engine starting at temperatures below approximately 30° C., while at temperatures above approximately 30° C. the spring force is insufficient to displace said slide valve.

4,193,385

ENGINE STOPPING DEVICE

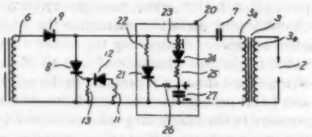
Mitsuo Katsumata; Hiroo Sato, both of Susono; Yoshihiko Ikeda, Shizuoka, and Tomikazu Fujita, Katano, all of Japan, assignors to Kokusan Denki Co., Ltd., Numazu, Japan

Filed Aug. 10, 1977, Ser. No. 823,272

Claims priority, application Japan, Aug. 16, 1976, 51-109473[U]; Oct. 5, 1976, 51-133297[U]; Oct. 5, 1976, 51-133298[U]; Oct. 5, 1976, 51-133299[U]; Oct. 5, 1976, 51-133300[U]; Oct. 5, 1976, 51-133301[U]; Oct. 5, 1976, 51-133302[U]

Int. Cl.[2] F02B *77/08*

U.S. Cl. 123—198 DC **5 Claims**



1. An engine stopping device for stopping an internal combustion engine provided with an ignition system energized by a generator driven by the engine, said stopping device com-

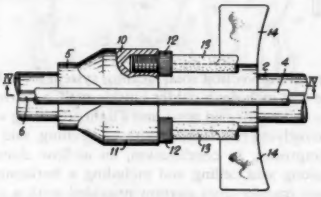
prising a first thyristor for providing a bypass in shunt with a power source of the ignition system, said thyristor being connected across the ignition power source, a series circuit of a resistor and a capacitor, said series circuit being connected across a gate and cathode of said thyristor so that said capacitor is charged by the voltage drop across the gate and cathode of said thyristor, and a manually-operated self-returning switch which is adapted to couple said ignition power source and the gate of said thyristor so that a trigger signal is supplied to said thyristor when the self-returning switch is operated to stop the engine.

4,193,386

SPEAR GUN

Jean-Francois Rossi, RN 209 Quartier du Bouvillard, Carros, France

Filed Mar. 31, 1978, Ser. No. 892,062
Claims priority, application France, Apr. 1, 1977, 77 10681
Int. Cl.² F41B 7/04
U.S. Cl. 124—22 **3 Claims**



1. A spear gun comprising
(a) a rod;
(b) a sleeve slidably but non-rotatably mounted on said rod;
(c) guide means for a projectile at the forward end of said rod;
(d) a hand grip at the rear end of said rod provided with trigger release means for a projectile;
(e) a resilient means for projecting a projectile;
(f) means on said sleeve for fastening thereto one end of said resilient means;
(g) a pair of cross bars extending radially outwardly from said sleeve in a substantially horizontal direction;
(h) and means for automatically releasably locking said sleeve at any position along said rod, against the action of said resilient means, said locking means comprising
(i) an elongated recess in said sleeve in communication with said sleeve interior, said recess having a floor inclined downwardly from its forward end to its rear end and essentially in alignment with the longitudinal axis of the gun; and
(ii) a rollable member within said recess freely movable therein from a rear position in which said member is clear of said rod, to a forward position in which said member is caught between said recess floor and said rod, thereby locking said sleeve to said rod.

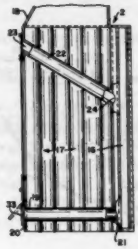
4,193,387

HIGH EFFICIENCY HEAT RETURN FIREPLACE

Oren W. Cline, R.R. #3, Edwardsville, Ill. 62025

Filed Jul. 29, 1977, Ser. No. 820,304
Int. Cl.² F24B 7/00
U.S. Cl. 126—121 **4 Claims**

1. A fireplace unit, comprising:
an enclosure including a first housing and a second housing, said second housing defining a fire box for consumption of combustible material, said first housing having a first pair of oppositely opposed side walls, a back wall and a bottom wall, all connected to one another, said second housing having a second pair of oppositely opposed side walls, a back wall, and a bottom wall, the side walls, back and bottom walls of said second housing being spaced from, but generally coextensive with the corresponding walls of said first housing to delimit a heat chamber about said fire box, individual ones of the side walls and the bottom wall of said second housing being formed from a single sheet of material having a plurality of undulations formed in it, the undulations having generally alternate peaks and valleys, the undulations of said bottom wall of said second housing defining with the bottom wall of said first housing a plurality of tubular sections extending along the depth of said fire box, said tubular sections communicating with the environment of said fireplace unit on one end and with said heat chamber on another end along the back walls of said first housing and said second housing:
a plurality of pipes extending along an upper end of said fire



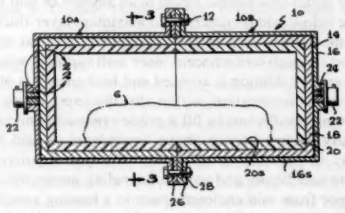
box and communicating with said heat chamber and the room environment of said fireplace so as to provide an air flow path from said room through said tubular sections to said heat chamber, and from said heat chamber through said plurality of pipes to said room, the heat chamber about said fire box enabling air in said air flow path to be heated from said fire box along the opposed side walls, back wall and bottom wall of said second housing, while said pipe plurality permits heating of air in said air path along the upper end of said fire box;
flue means connected to said fire box to conduct hot gases from said fire box past said plurality of pipes and to the atmosphere;
means for controlling air input to said heat chamber; and
means for controlling air output from said plurality of pipes.

4,193,388

PORTABLE HEATABLE CONTAINER

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Lien C. Yang, La Canada, Calif.

Filed Apr. 19, 1978, Ser. No. 897,831
Int. Cl.² F24J 1/00
U.S. Cl. 126—263 **2 Claims**



1. A cannister apparatus which can self sterilize its outside surface while avoiding excessive heating of goods within the cannister, comprising:
walls forming a container for surrounding the goods;

a layer of combustible material surrounding said container walls to lie over substantially all areas of said container; and

a layer of insulation lying within said container to insulate the goods from heat generated by the combustible material.

4,193,389

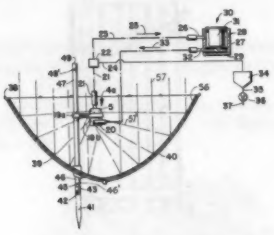
SOLAR RADIANT ENERGY UMBRELLA

Paul H. Y. Ku, 47-50 59th St./6E, Woodside, N.Y. 11377

Filed Nov. 2, 1977, Ser. No. 847,767

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—451 **8 Claims**



1. A device for harnessing radiant solar energy comprising in combination: an elongated supporting structure, a concave reflective surface adapted to receive a plurality of rays of radiant energy such that reflected rays converge to a substantially common point substantially coincident with space associated with the concave reflective surface, said elongated supporting structure including a first end extending from said reflective surface in juxtaposition to and spaced-from said common point, and an opposite remaining end of said elongated supporting structure extending from an opposite face of the concave reflective surface and adapted for supporting the concave reflective surface in a predetermined energy ray-receiving position; clamping means for clamping a liquid-containable vessel onto said first end of said elongated supporting structure, adapted such that a liquid-containable vessel supported by said clamping means is positioned substantially at said common point; and as the liquid-containable vessel, a liquid-containable vessel of predetermined shape at said common point, the predetermined shape being characterized to maintain liquid adjacent inner wall surfaces of the liquid-containable vessel and within a thickness range below a predetermined maximum layer-thickness such that liquid volume does not exceed volume required for absorbing all energy transmitted through said inner wall surfaces; and a vaporizable liquid within the liquid-containable vessel in an amount of said thickness range below said predetermined maximum layer-thickness of a volume sufficient to absorb substantially all heat energy transmitted through said adjacent inner wall surfaces, whereby excessive energy dilution is avoided and heat energy is obtainable in high concentration within the thickness range, said amount being insufficient to fill a predetermined minimum of substantially enclosed space above liquid level of said liquid sufficiently to provide for collection of vapor vaporized by heat within said liquid, and vapor channeling means for channeling vapor from said enclosed space to a heating vessel into enclosure space thereof, and as said heating vessel, a liquid-containable heating vessel connected to receive vapor by said vapor channeling means, said vapor channeling means including a liquid-trapping means for trapping liquid physically carried by vapor from the enclosed space passing through said vapor channeling means.

4,193,390

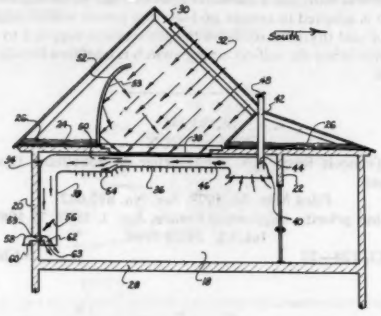
SOLAR HEATING SYSTEM

Maurice E. Hatten, 1482 Ashland Ave., Columbus, Ohio 43212

Filed Mar. 1, 1978, Ser. No. 882,409

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—429 **9 Claims**



1. A natural convection solar heating system for a building of the type that includes a colder outside wall, a warmer interior zone, a ceiling for said zone, and a light admitting window, in spaced overlying relationship with said ceiling, said heating system comprising, in combination, an airflow duct means extended along said ceiling and including a horizontally extending heat transfer duct portion provided with a top heat absorbing duct wall exposed to said light admitting window, an expension plenum downstream of said heat absorbing duct wall, a duct inlet communicating with said warmer interior zone for receiving an air-flow therefrom, a downwardly extending duct portion positioned adjacent said colder outside wall and forming a continuation of said heat transfer duct portion, and a duct outlet located at a substantial distance below said duct inlet for delivering the airflow to said zone.

4,193,391

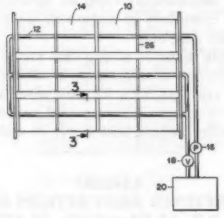
SOLAR HEATING SYSTEM

George White, Asheville, N.C., assignor to Whiteline, Inc., Asheville, N.C.

Filed Mar. 9, 1977, Ser. No. 775,871

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—438 **8 Claims**



1. A reflector structure to be used in a solar heat collecting system having a liquid circulating arrangement, including piping, circulating pump and an insulated storage tank wherein the improvement comprises the combination of: a resilient sheet metal reflector plate; said reflector plate having been bent into a substantially parabolic form below the elastic breaking point thereof; said plate having flange portions extending from its longitudinal edges; at least a portion of said flange portions being substantially horizontal when said reflector plate is in its bent position; a pipe for circulating liquid extending along the focal point of said substantially parabolic reflec-

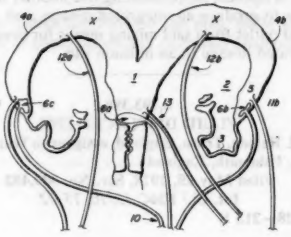
tor plate; a transparent cover plate contacting said flange portions and bridging a space between said flange portions to form an enclosure for said pipe; means for securing said transparent cover plate to said flange portions; means holding said resilient sheet metal reflector in said substantially parabolic form and preventing said resilient sheet metal reflector from springing out of said parabolic form.

4,193,392

METHOD FOR REMOVING OVA FROM ANIMALS

Gordon R. Barnett, Cape Rodney Farm, P.O. Box 95, Leigh, Warkworth, New Zealand

Filed Sep. 23, 1977, Ser. No. 836,106
Int. Cl.[2] A61B *19/00;* **A61M** *25/00*
U.S. Cl. 128—1 R **1 Claim**



1. A method of repeatedly flushing ova from the uterus of an animal including the steps of:

(a) surgically implanting in the uterus at least one inlet cannula extending from the uterus to the exterior of the animal;

(b) surgically implanting in the uterus at least one outlet cannula extending from the uterus to the exterior of the animal;

(c) surgically implanting in a lower region of the uterus an inflatable diaphragm, and surgically implanting an inflation tube passing from the inflatable diaphragm to the exterior of the animal;

(d) inflating said diaphragm prior to inserting a flushing fluid through said inlet cannula and withdrawing said flushing fluid through said outlet cannula to thereby withdraw an ovum or ova from the uterus;

(e) deflating said diaphragm after flushing has been completed; and

(f) repeating steps (d) and (e) each time it is desired to flush an ovum or ova from the uterus.

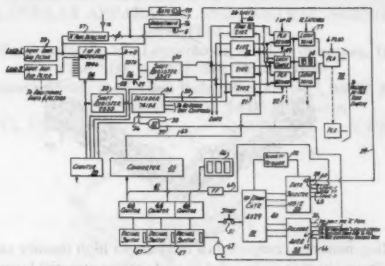
4,193,393

DIAGNOSTIC APPARATUS

Kenneth J. Schlager, Elm Grove, Wis., assignor to International Bio-Medical Industries, Newport Beach, Calif.

Filed Aug. 25, 1977, Ser. No. 827,600
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—710 **20 Claims**

1. A diagnostic instrument having means to receive a waveform signal and adapted to drive a display means, comprising input means for sequentially sampling said waveform signal in time spaced samples and having digitizing means for digitizing said waveform samples into a series of time spaced digital samples which uniquely represent the characteristic of such waveform, storage means connected to said input means and having address means for recording said waveform samples as the series of time spaced digital signals, a preset referenced means defining a series of selected positions on the waveform as predetermined combinations of said sampled waveform characteristics and time intervals and having an output means, and address means connecting the storage means to the referenced means and providing an encoded indication output on said output means of normality and abnormality based on the waveform combination and the preset reference, said output means adapted to be connected to said display means and



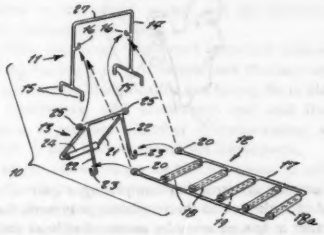
provide a display of said indication output for diagnosis of said waveform.

4,193,394

BACK WALKER AND MASSAGE DEVICE

Billy Everett, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of, New York, N.Y. 10007

Filed Aug. 18, 1978, Ser. No. 935,019
Int. Cl.[2] A61H *15/00*
U.S. Cl. 128—57 **5 Claims**



1. A back walker, comprising in combination, a stand, a roller rack and a crank, said rack selectively being supported either directly from said stand or from said crank which is supported on said stand, and said rack including a plurality of parallel, spaced-apart rollers rotatable on bearings on bars slidable on channels of said rack, and spring means allowing change of distances between said rollers during an exercise.

4,193,395

REMOVABLE CAST FOR INTERMEDIATE PHASE ORTHOPEDIC REHABILITATION

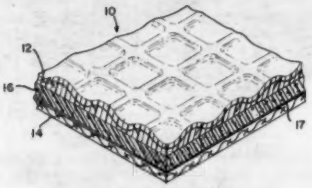
William A. Gruber, 18 Maple Rd., Wellesley, Mass. 02181

Filed Aug. 24, 1978, Ser. No. 936,620
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—90 **21 Claims**

1. A removable orthoedic cast, comprising: a sectional cast structure made up of two cast sections joined together by a common cast portion, said cast sections terminating in respective edges which may be positioned adjacent one another to enclose said cast structure about a body portion to be supported, said common cast portion being sufficiently flexible to permit said sections to be spread apart at their edges for removal of said cast structure from the body portion, said cast structure being composed of an outer layer of thermoplastic casing material, an inner layer of lining material, and an intermediate layer of padding material bonded to said outer and inner layers.

11. An orthopedic cast structure, comprising: a layer of

casting material composed of reinforced epsilon polycapriolactone; a layer of lining material; and an intermediate layer of



padding material composed of medium to high density closed cell elastic sheet foam bonded to said casting material layer and said lining material layer.

4,193,396

PAIRED EARPLUG CONSTRUCTION

Albert R. Wacker, Zionsville, Ind., assignor to E-A-R Corporation, Indianapolis, Ind.

Filed Apr. 28, 1978, Ser. No. 900,982
Int. Cl.[2] A61F *11/02*
U.S. Cl. 128—152 **7 Claims**

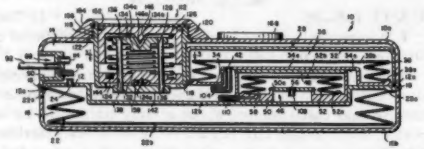
1. An earplug construction comprising a pair of earplugs composed of a plasticized thermoplastic polymeric foam tethered together in spaced array by means of at least one flexible cord element composed of a plasticized thermoplastic material, fixation of said cord element to said earplugs being by ultrasonic weldments of the ends of said cord element to the polymeric foam material of said earplugs.

4,193,397

INFUSION APPARATUS AND METHOD

Elton M. Tucker, Medfield, and Frank R. Prosl, Duxbury, both of Mass., assignors to Metal Bellows Corporation, Sharon, Mass.

Continuation-in-part of Ser. No. 856,558, Dec. 1, 1977, abandoned. This application Feb. 5, 1979, Ser. No. 9,756
Int. Cl.[2] A61M *31/00*
U.S. Cl. 128—207.19 **15 Claims**



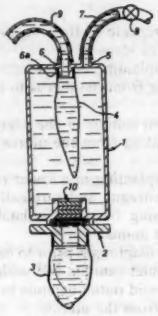
1. Nonelectrical implantable infusion apparatus comprising:
A. a housing;
B. a first collapsible infusate reservoir having an outlet and positioned inside the housing;
C. means for collapsing said first reservoir to expel infusate from its said outlet;
D. a second collapsible infusate reservoir having an outlet and positioned in the housing;
E. means for collapsing said second reservoir to expel infusate from its said outlet;
F. mixing means inside the housing and having a selected volume;
G. a first flow path having a first flow restriction characteristic connected betweem said first reservoir and said mixing means;
H. a second flow path having a second flow restriction characteristic connected between the said second reservoir and the mixing means;
I. a normally closed valve connected in said second flow path so that infusate flows from said second reservoir to the mixing means only when said valve is opened, the infusates from said first and second reservoirs, when said valve is opened, supplementing one another in the mixing means to produce an integrated dosage, and
J. a fluid outlet from said mixing means for conducting said integrated dosage to an infusion site.

4,193,398

FLUID DISPLACEMENT

Bernard H. Refson, Truro, England, assignor to Watson-Marlow Limited, Falmouth, England

Filed May 25, 1978, Ser. No. 909,453
Int. Cl.[2] F24C *15/10, 15/22*
U.S. Cl. 128—213 R **12 Claims**



1. An extracorporeal osmotic pump comprising a first chamber for containing an osmotically stronger solution; a second chamber for containing an osmotically weaker solution or pure solvent; a duct located between the said chambers placing them in communication; a semi-permeable membrane across said duct located nearer the said second chamber; and at least one layer of liquid-permeable porous material across said duct located nearer the said first chamber, whereby it acts as a flow-control means.

4,193,399

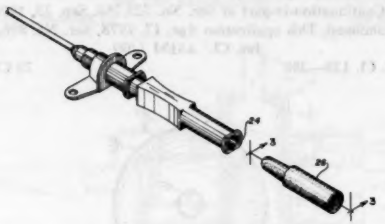
SELF VENTING PLUG FOR VENOUS ENTRY UNIT

Thomas P. Robinson, Dallas, Tex., assignor to Travenol Laboratories, Inc., Dallas, Tex.

Filed Jul. 8, 1977, Ser. No. 813,890
Int. Cl.[2] P61M *5/00*
U.S. Cl. 128—214.4 **11 Claims**

1. In a venous entry unit having a hollow needle and a hollow flashback chamber proximal of the needle in fluid communication therewith for obtaining a visual indication of blood vessel entry by flow of blood into the chamber, the chamber having a proximal opening, the improvement comprising:
a self venting plug removably seated in the proximal opening of the flashback chamber and sealingly engaging the inside surface of the flashback chamber adjacent the opening,

said plug having as its major portion an integrally formed body of solid porous plastic material with pores therein of predetermined size to provide a flow path for air from the



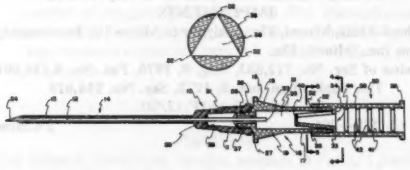
chamber outwardly through the plug while preventing the flow of blood outwardly from said chamber through said plug.

4,193,400

INTRAVENOUS NEEDLE ASSEMBLY WITH AIR BLEED PLUG

James C. Loveless, and Darrel R. Palmer, both of Sandy, Utah, assignors to The Deseret Company, Sandy, Utah

Filed Jun. 16, 1978, Ser. No. 916,657
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—214.4 **10 Claims**



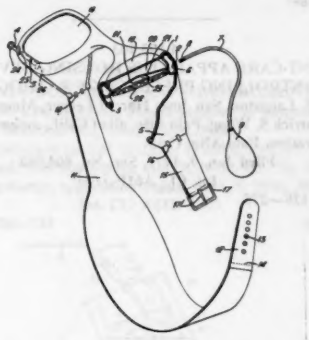
1. A catheter placement assembly comprising:
a needle for penetrating the vein of a patient;
a catheter tube to be placed in the vein and left indwelling after venipuncture;
a flashback chamber connected to the trailing end of the needle, said flashback chamber having an opening at its trailing end;
an air bleeder plug formed of a substantially shape-retaining biologically inert material removably secured to the trailing end of the flashback chamber, the plug comprising means substantially closing the trailing end opening of the flashback chamber, said closing means comprising sidewall means in close at least partial contiguous relation with the trailing end of the flashback chamber and continuously open narrow elongated slit means disposed in said sidewall means in continuous gaseous communication across and interposed between the flashback chamber and the atmosphere directly adjacent and closely spaced from the flashback chamber, the elongation of the narrow slit means embodying a substantial longitudinal dimension accommodating egress passage of air to the atmosphere without deflection of the slit means while substantially preventing passage of egress blood through the slit means.

4,193,401

ORBITAL COMPRESSION CHAMBER FOR THE CURE OF INTERNAL WOUNDS AND INFLAMMATION OF THE OCULAR APPARATUS AND CENTRAL NERVOUS SYSTEM

Rosolino Marinello, Via Leonardo da Vinci, 4 -Mantova, Italy

Filed Mar. 9, 1978, Ser. No. 885,046
Claims priority, application Italy, Mar. 17, 1977, 84917 A/77
Int. Cl.[2] A61M 7/00; A61F 13/12
U.S. Cl. 128—260 **6 Claims**



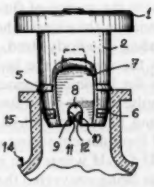
1. An appliance for the cure of internal injuries, wounds, or inflammation to the ocular organs and the central nervous system of a patient comprising:
(a) a hollow spectacles framework provided with an ocular opening having a pair of membranes thereacross, one of said membranes being flexible and facing the ocular side of said framework, said membranes and said framework defining a pressure chamber communicating with the interior of said hollow spectacles framework;
(b) means for connecting a source of pressure to said hollow framework to provide pressure to the pressure chamber;
(c) a dressing impregnated with a medicament affixed to said flexible membrane on its ocular side; and
(d) a mounting means for securing said framework against the orbital cavity of said patient.

4,193,402

BOTTLE STOPPER AND METHOD OF USING SAID STOPPER

Jean-Jacques Rumpler, 1 Allee Marie-Louis, Montsoult, France (95360)

Filed Feb. 2, 1979, Ser. No. 8,885
Claims priority, application France, Feb. 8, 1978, 78 03554
Int. Cl.[2] B65D 51/16
U.S. Cl. 128—272 **13 Claims**



1. A bottle stopper comprising a cap and a skirt portion extending from said cap and adapted to be received in a neck portion of a bottle, said skirt member comprising:
(a) a flange arranged on said skirt member;
(b) a first slit extending from the lower end of said skirt,

which is spaced from said cap, to a point on said skirt between said lower end and said cap; and

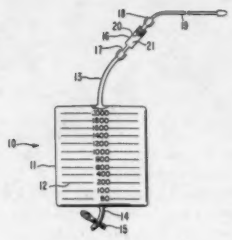
(c) a second slit extending from the lower end of said skirt to a point on said skirt between said flange and said lower end; said second slit being bordered by first and second edges, each of said first and second edges comprising a protuberance, each of said protuberances being adapted to abut one another and space each of said first and second edges when said stopper is inserted in a bottle such that said skirt is inserted within said bottle to a level below said flange.

4,193,403

PATIENT-CARE APPARATUS HOUSING DEVICE FOR CONTROLLING PRESENCE OF PATHOGENS

Jimmy B. Langston, San Jose; Harold Leeper, Mountain View, and Patrick S. Wong, Palo Alto, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Jun. 9, 1977, Ser. No. 804,962
Int. Cl.² A61F *5/44*
U.S. Cl. 128—275 **1 Claim**



1. A patient-care apparatus consisting essentially of, in combination:

(a) a container for receiving and storing a biological fluid;

(b) an inlet port on the container for establishing fluid passage between the interior and the exterior of the container;

(c) an exit port on the container for draining fluid from the container, said port equipped with a clamp for controlling the amount of fluid drained from the container;

(d) a volumetric scale on the container for indicating the volume of fluid in the container;

(e) an exterior housing provided with an internal space for holding a dispensing device, said housing having an exit end adapted for receiving a catheter and in communication through a catheter with the inlet port of the container, and an inlet end adapted for receiving a catheter and in communication with a source of fluid through a catheter;

(f) a self-actuated, one-way valve in the exterior housing at its fluid receiving end for preventing fluid and pathogens from leaving the housing and entering the catheter that communicates with the source of fluid; and

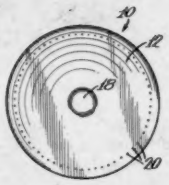
(g) a dispensing device in the exterior housing, said dispensing device consisting of a body sized, shaped and adapted for placement in the space in the housing and having at least one surface for imbibing moisture and dispensing a depolymerized polymer, the body formed of a polymeric material containing paraformaldehyde selected from the group of general formulas consisting of $(CH_2O)_n$ wherein n is 3 and $HO(CH_2O)_mH$ wherein m is from 3 to 125, said paraformaldehyde being converted therein in the presence of moisture imbibed by the body to formaldehyde, which formaldehyde, is dispensed by the surface of the device into the housing for preventing the migration of pathogens into the fluid source, and also is dispensed into the container during use for controlling the presence of pathogens in the container.

4,193,404

STRETCHABLE AND CONFORMABLE PAD

Virginia L. Repke, Oak Forest, and Robert C. Shepherd, Oak Lawn, both of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 725,764, Sep. 23, 1976, abandoned. This application Apr. 17, 1978, Ser. No. 896,841
Int. Cl.² A61M *1/00*
U.S. Cl. 128—280 **23 Claims**



1. A disposable nursing pad in the form of a stretchable and conformable body having an inner surface adapted to conform to the contour of a human breast and an outer surface adapted to be received within a brassiere which comprises a fibrous, fabric facing layer defining said inner surface, an absorbent layer substantially coextensive with said facing layer, a moisture-impermeable backing overlying said absorbent layer, and securement means for binding said facing layer, said absorbent layer and said backing layer forming a unitary pad, at least one of said layers being constructed from an extensible compressively shrunk fabric web providing stretchability and conformability, said securement means being defined by a plurality of securement zones spaced from one another circumferentially about the periphery of the pad.

4,193,405

DETECTABLE MEDICAL AND SURGICAL IMPLEMENTS

Michael Abels, Miami, Fla., assignor to Micro Tec Instrumentation Inc., Miami, Fla.

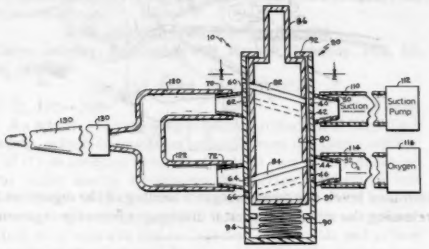
Division of Ser. No. 712,883, Aug. 9, 1976, Pat. No. 4,114,601. This application Jun. 9, 1978, Ser. No. 914,615
Int. Cl.² A61F *13/00*
U.S. Cl. 128—296 **2 Claims**

1. A surgical sponge detectable within the human body comprising of surgical absorbant material incorporating a transponder capable of non-linear mixing of two or more radiofrequency signals impinging thereon, to thereby generate and reradiate a higher order product frequency; directing two or more radiofrequency signals towards the portion of the human body to be investigated; placing receiving means in the vicinity of said investigated portion to detect and visually or audibly indicate the presence of any reradiated higher order product frequency signals emanating from the investigated area; the existence of said reradiated signals indicating that said surgical sponge is within the human body.

4,193,406
DUAL PURPOSE CATHETER

Walter J. Jinotti, 10 Scott St., New Brunswick, N.J. 08901

Filed Sep. 18, 1978, Ser. No. 943,387
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—204.18 9 Claims



1. A dual-purpose catheter comprising

an elongated tube having an insertion end and a valve connection end, said insertion end adapted for coupling to the human body and said valve connection end adapted for alternate connection to a source of suction or a source of oxygen.

adjustable valve means connected to said valve connection end and disposed between said tube and said sources of suction and oxygen,

said valve means including therein first and second through-passage means, said first through-passage means being adapted to be disposed (1) in a first position in which it is connected between said suction source and said tube and (2) in a second position in which it is connected between the environment and said suction source, and, when said first through-passage means is in said first position, said second through-passage means is in a first position in which it is connected between the atmosphere and said source of oxygen and, when said first through-passage means is in said second position, said second through-passage means is connected between said tube and said source of oxygen.

4,193,407
PACIFIER

Ove Edmark, Sandviken, Sweden, assignor to Per A. Ljungberg, Corona Del Mar, Calif.

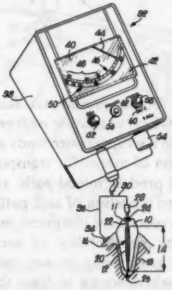
Filed Jan. 9, 1978, Ser. No. 867,776
Claims priority, application Sweden, Oct. 28, 1977, 7712191
Int. Cl.[2] A61J *17/00*
U.S. Cl. 128—360 10 Claims

1. A baby pacifier of the type that includes a resilient nipple having a bulb that develops into a tubular neck, a rigid disc that has said nipple projecting from one side thereof, a handle, and means for supporting said handle from an opposite side of said disc, said pacifier being characterized by said nipple having a non-toxic material therein having a sufficiently disagreeable taste that a baby will reject said pacifier when the baby bites through said nipple and said non-toxic material mixes with the saliva of the baby.

4,193,408
ENDODONTIC THERAPY INSTRUMENT

Shoji Fujino, Kita Ooizumi, Japan, assignor to Shirota Electric Furnace Material Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 751,381, Dec. 17, 1976, abandoned. This application Jun. 7, 1978, Ser. No. 913,361
Claims priority, application Japan, Mar. 5, 1976, 51/26057
Int. Cl.[2] A61B *5/05*
U.S. Cl. 128—734 10 Claims



1. A device for measuring penetration into a root canal of a tooth, including:

an electrically conductive probe;

means operably coupled with said probe for producing an electrical measurement signal corresponding to the penetration of said probe in said canal;

meter means for measuring the penetration of said probe in said said canal,

said meter means including an electrically responsive, shiftable indicator, and first and second graduated scales operatively associated with said indicator for respectively displaying the penetration of said probe in first and second ranges in said canal,

said second range of penetration being smaller than said first range thereof,

said second scale having the graduations thereof expanded whereby to enhance the accuracy of displaying the penetration of said probe in said second range thereof; and

electrical circuit means operably coupled with said signal producing means and with said meter means, for operating on said measurement signal to selectively generate and apply to said meter means first and second control signals respectively corresponding to the penetration of said probe in said first and second ranges thereof in said canal,

said first control signal being operable for producing shifting of said indicator in one direction to display the penetration of said probe in said first range thereof on said first scale,

said second control signal being operable for producing shifting of said indicator in another direction to display the penetration of said probe in said second range thereof on said second scale.

4,193,409

METHOD AND APPARATUS FOR REGULATING THE PERMEABILITY OF WRAPPING MATERIAL FOR ROD-SHAPED SMOKERS' PRODUCTS

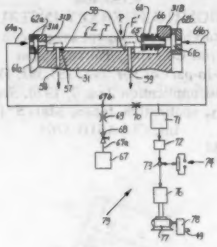
Günter Wahle, Reinbek; Uwe Heitmann, Schwarzenbek; Erwin Oesterling, Hamburg, and Rolf Dahlgrün, Schwarzenbek, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. Kg., Hamburg, Fed. Rep. of Germany

Filed Oct. 11, 1977, Ser. No. 841,108

Claims priority, application Luxembourg, Oct. 13, 1976, 75989

Int. Cl.[2] A24C 5/32

U.S. Cl. 131—23 R **23 Claims**



11. In a machine for the production and/or processing of rod-shaped articles which constitute or form part of smokers' products and wherein a wrapper surrounds at least one rod-like filler, the combination of means for transporting a succession of wrappers along a predetermined path; adjustable perforating means adjacent to a portion of said path and being operative to make holes in successive wrappers; means for pneumatically monitoring the permeability of successive wrappers downstream of said perforating means, including means for generating first signals denoting at least the permeability of those portions of successive wrappers which are provided with holes in said portion of said path; means for furnishing a reference signal denoting the desired permeability of wrappers; means for comparing said first signals with said reference signal, including means for transmitting third signals denoting the differences between said first signals and said reference signal; and means for adjusting said perforating means in response to said third signals so as to increase the combined area of holes in the wrappers when the desired permeability exceeds the monitored permeability and vice versa.

4,193,410

APPARATUS FOR MAKING VENTILATED CIGARETTES

Robert E. Williams, Deptford, England, and Clifford R. Marritt, Richmond, Va., assignors to Molins, Limited, England

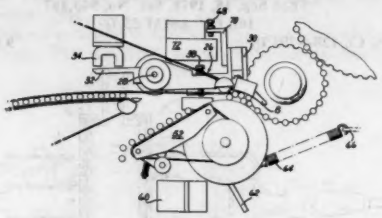
Filed Feb. 22, 1978, Ser. No. 880,104

Claims priority, application United Kingdom, Feb. 22, 1977, 7300/77

Int. Cl.[2] A24C 5/60

U.S. Cl. 131—170 R **10 Claims**

1. A cigarette perforating device comprising a pair of facing working members normally spaced apart by a distance equal to the diameter of a cigarette, means for feeding cigarettes into the space between the members, drive means for moving one of the members relative to the other so as to roll cigarettes between them, perforating means projecting from the surface of one of the members and arranged to puncture the wrappers of cigarettes as they are rolled between the members, movable mounting means for one of the said members, said mounting means being so arranged that the said one member can move away from its operative position; and releasable retaining means which normally retains the member in its operative position but responds to an increase in pressure, above a predetermined level, due to an incorrect feeding of the cigarettes by releasing the member so that it disengages from the cigarettes.



4,193,411

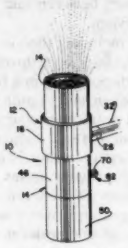
POWER-OPERATED SMOKING DEVICE

Ted V. Faris, Westminster, and Sanford W. French, IV, Costa Mesa, both of Calif., assignors to Raymond W. Reneau, Westminster, Calif.

Filed Jun. 13, 1977, Ser. No. 805,961

Int. Cl.[2] A24F 1/10, 47/00

U.S. Cl. 131—171 R **4 Claims**



1. A smoking device providing a regulated continuous flow of smoke therethrough, the device comprising:

a housing having an upper and lower section;

a bowl to receive tobacco therrein, said bowl being formed in said upper section of said housing;

an air chamber juxtaposed to said bowl and formed in said upper section to communicate with said bowl;

a cup member removably disposed in said bowl, said cup having a plurality of openings formed therein adjacent said air chamber in order to receive tobacco therein;

an outlet passage formed in said upper section and positioned to operably communicate with said air chamber;

fan means mounted in said housing and disposed to provide an air flow from said bowl and a discharge through said outlet passage, said means including a fan positioned within said air chamber and an electric motor supported with said housing;

a power supply means electrically connected to said fan means;

wherein said power supply comprises at least one battery mounted in said lower section of said housing;

and wherein said lower section thereof comprises an upper body member and a lower body member, said body members being removably attached to each other;

switch means electrically connected between said fan means and said power supply means, whereby said fan means is selectively operated to provide air flow through said smoking device.

4,193,412

ADDITIVE FOR SMOKING TOBACCO PRODUCTS, FILTER ELEMENTS THEREOF AND PROCESS FOR THE PREPARATION THEREOF

Ernst Heim, Denzlingen; Dieter Imbery, Emmendingen, and Bruno Kliemann, Freiburg im Breisgau, all of Fed. Rep. of Germany, assignors to Rhodia AG, Freiburg im Breisgau, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,400

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658479

Int. Cl.[2] A24B *15/00, 15/027*

U.S. Cl. 131—264 16 Claims

1. An additive for smoking tobacco products and their filter elements, which is a member selected from the group consisting of (1) an intimate mixture of at least two highly dispersed metal oxides having a large specific surface area; (2) an intimate mixture of at least two highly dispersed metal oxyhydrates having a large specific surface area; (3) an intimate mixture of at least one highly dispersed metal oxide and at least one metal oxyhydrate both having a large specific surface area; (4) an intimate mixture of different forms of the same metal oxide; (5) an intimate mixture of different forms of the same metal oxyhydrate, the mixture exhibiting liquid-like properties anomalous for a mixture of solids, and specific properties of the mixture, such as the bulk density, the surface area, the flowability and the absorption capacity for gases and vapors not representing an additive value of the proportions of the mixing components, and the absorption capacity for toxic substances in the tobacco smoke being synergistically increased.

4,193,413

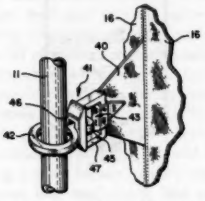
DISENGAGING CONNECTOR FOR ATTACHING FABRIC TO A TUBULAR SUPPORT MEMBER

Paul J. Watts, Sandy; Lynn D. Crawford, and Philip T. Nichols, both of Salt Lake City, all of Utah, assignors to American Ecosystems, Inc., Salt Lake City, Utah

Filed Oct. 10, 1978, Ser. No. 950,257

Int. Cl.[2] A45F *1/04, 1/18*

U.S. Cl. 135—2 7 Claims



1. In a collapsible shelter of the umbrella-tent type wherein the shelter includes a foldable frame and a cover of sheet material affixed to the frame, with said frame comprising a plurality of support members for supporting said cover when said frame is erected, and means for slidably attaching intermediate portions of said cover to said support members, the improvement wherein said means for slidably attaching said cover to said support member comprises:

a ring member circumscribing its respective support member and adapted for sliding movement along said support member;

a stem projecting substantially radially outwardly from the ring member, said stem having a substantially square cross section;

a pair of studs at the end of said stem extending from mutually opposite sides of said stem in a direction substantially perpendicular thereto;

a locking connector made of a resilient material, said connector including a face portion having a thickness no greater than the length of said stem between said ring and said lugs, said face having a substantially rectangular opening therein, said opening having a width substantially the same as the thickness of said stem and a height sufficient so that the end of said stem with said lugs thereon can be inserted through said opening, said connector also having means for attaching the appropriate portion of said cover thereto,

whereby said connector with cover attached can be releasably locked in engagement with said ring member by inserting the end of said stem with the lugs thereon through the opening in said connector and then turning the connector one-quarter turn to snap the stem into locking engagement therewith.

4,193,414

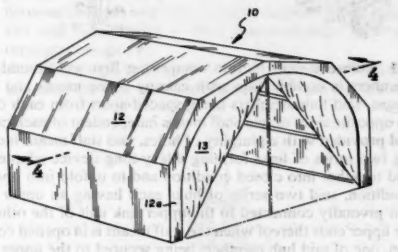
COLLAPSIBLE AND PORTABLE STRUCTURE

John E. Trochman, Delano, Delano, Minn. 55328

Filed Jun. 26, 1978, Ser. No. 918,959

Int. Cl.[2] A45F *1/16*

U.S. Cl. 135—4 R 6 Claims



1. A collapsible shelter structure including:

a. a front and rear foldable frame structure

b. a plurality of longitudinally extending connective members extending between and connecting said front and rear frame structures;

c. each of said front and rear foldable frame structures including a pair of support contacting, link sections and at least one scissor link structure connected to said support contacting links;

d. each of said support contacting links including a first link member having one end thereof arranged for engagement with a support surface and having an upper end and including a scissor link having a first end thereof pivotally connected to said first link in spaced relation to said upper end of said first link member, said scissor link providing a pivotal attachment means in spaced relation to said first end and spaced from the other end thereof;

e. each of said scissor link structures including a pair of link members arranged in side-by-side relation and pivotally connected to one another generally centrally thereof and having a first pivotal connective end arranged for and pivotally connected to said upper end of said first link member and a second pivotal connection arranged in spaced relation to the other end thereof for connection to said support contacting link;

f. a covering material extending over and connected to the longitudinal struts of the structure;

g. a plurality of scissor link structures providing said front and rear foldable frame structures; and,

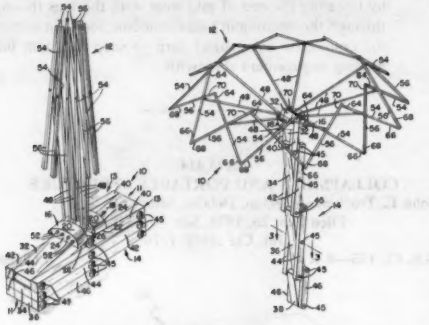
h. each of said links of said scissor structures including an extending portion from said second pivotal connection and the end of said link, said extending portion being arranged in abutting relation to the next adjacent link of the next adjacent scissor structure.

4,193,415

UMBRELLA CANOPY FRAME AND STAFF CONSTRUCTION

Terry Hermanson, c/o Mr. Christmas Incorporated, 41 Madison Ave., New York, N.Y. 10010

Filed Jan. 9, 1979, Ser. No. 2,060
Int. Cl.[2] A45B *19/00*
U.S. Cl. 135—25 R **12 Claims**



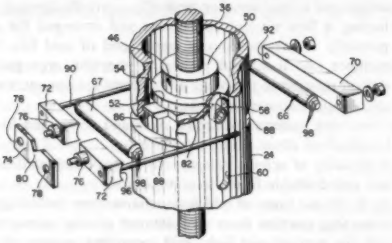
1. Umbrella construction comprising first and second hub members in combination with canopy frame means and staff means, said hub members being spaced-apart from each other on opposite sides of said staff means independent of each other, and provided with a plurality of holes, said staff means including two series of links forming a lazy-tong device adapted to fold together into closed condition and to unfold into opened condition, said two series of links each having an upper link unit pivotally connected to the upper link unit of the other at the upper ends thereof when the staff means is in opened condition, one of said hub members being secured to the upper link unit of one of said series of links adjacent the upper end thereof, the other of said hub members being secured to the upper link unit of the other of said series of links adjacent the upper end thereof and on a side of said staff means opposite from said one of said hub members, said canopy frame means including a circumferentially extending series of pairs of ribs, each rib of said pairs being pivotally connected to the other at a point intermediate the opposite ends thereof, a plurality of spokes each having a radially inner end extending in a separate one of said holes of said hub members and a radially outer end pivotally secured to a separate pair of said ribs at said intermediate point thereof.

4,193,416

THERMAL RESPONSIVE VALVE

Richard S. Slawson, Barrington, R.I., assignor to G. W. Dahl Company, Inc., Bristol, R.I.

Filed Jan. 30, 1978, Ser. No. 873,737
Int. Cl.[2] F16K *17/38*
U.S. Cl. 137—75 **17 Claims**



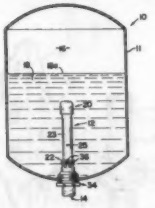
1. A thermal responsive valve comprising a valve body having a flow path therthrough, a member within said body movable between a first position wherein said flow path is open and a second position wherein said flow path is closed, means normally urging said movable member towards said second position, restraining means associated with said member for normally holding said member in said first position, said restraining means including movable means and retaining means for said movable means, said movable means normally positioned in blocking contact with said member so as to prevent movement thereof by said urging means, said retaining means having separate spaced portions normally in contact with said movable means and a separable link interconnecting said spaced portions and under tension thereby, at least one of said spaced portions mounted for outward deflection with respect to said movable means and movable to a second and further spaced apart position, whereby when said link separates due to a predetermined external condition, said spaced portions move to said second position thereof thus permitting said movable means to move with respect to said member and out of holding relationship therewith which in turn enables said urging means to move said member to said second position, said movable means comprising at least one elongated pin having a portion thereof disposed in lateral contact with and in the travel path of said member, said urging means continually urging said member against said pin, the movement of said spaced portions to said second position thereof adapted to release said pin so that said member can force such pin out of its travel path.

4,193,417

FLUID CHECK VALVE DEVICE

George F. Bowman, Apartado Postal 4141, San Jose, Costa Rica, and Kenneth A. Prescher, 834 E. River Dr., Tampa, Fla. 33617

Filed May 5, 1978, Ser. No. 903,067
Int. Cl.[2] F04F *1/06*
U.S. Cl. 137—192 **5 Claims**



1. A fluid check valve device for use with a gas precharged fluid storage tank; said fluid check valve device comprising a hollow valve body operatively mounted within the precharged fluid storage tank, said hollow valve body having a float chamber formed therein and a lower check valve assembly disposed at the lower end thereof, said hollow valve body having at least one antivortex aperture formed on the lower portion thereof above said lower check valve assembly, said lower check valve assembly comprising a lower valve seat and lower float member disposed to move between a sealed and unsealed position relative to said lower valve seat, said lower float member moving from said unsealed position to said sealed position when the fluid level within the gas precharged fluid storage tank approaches said antivortex aperture, said hollow valve body further includes at least one float control aperture formed on the intermediate portion thereof in spaced relation relative to said antivortex aperture to control the rate of vertical movement of said lower float member in response to the fluid level within the gas precharged fluid storage tank such that as fluid is drawn from the precharged fluid storage tank said lower float member remains in the uppermost portion of said hollow valve body until the fluid level reaches said float

control aperture causing said lower float member to rapidly accelerate downward to said sealed position.

4,193,418

ARRANGEMENT FOR PREVENTING EXCESS PRESSURE IN THE HOUSING OF SHUT-OFF VALVES

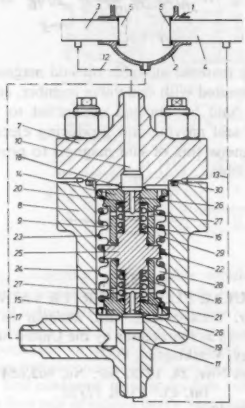
Walter Meyer, Duisburg, Fed. Rep. of Germany, assignor to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Sep. 2, 1977, Ser. No. 830,313

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1976, 2651986

Int. Cl.[2] F16K *17/02*

U.S. Cl. 137—118 **6 Claims**



1. An arrangement for the prevention of excess pressure comprising: an independent chamber; a shut-off valve with varying pressure load, said shut-off valve having a housing, two pipe sockets connected to said housing and facing each other and shut-off elements for closing said two pipe sockets; said independent chamber having two facing openings; pressure lines connecting said two facing openings to said pipe sockets; seal means and elastic elements for closing said openings; said elastic elements comprising bellow means; said seal means being connected gas-tight by said bellow means; said chamber having a space located outside said bellow means; an auxiliary pressure line discharging into said chamber space, said auxiliary pressure line being connected to the interior of said housing of said shut-off valve between said two pipe sockets; spring means; said seal means having elements urged apart by said spring means; and a center section located between elements of said seal means and connected to said seal means by said bellow means.

4,193,419

CONNECTOR APPARATUS FOR PRESSURIZED LINES

Alex Pellerito, 17740 NW. 17th Ave., Miami, Fla. 33054

Filed Apr. 4, 1978, Ser. No. 893,483

Int. Cl.[2] F16K *13/00*; **F16L** *55/10*

U.S. Cl. 137—322 **3 Claims**

1. For a passageway, a normally closed valve device sized to companionately mate with and to be installed in the passageway, said valve device comprising:

a valve mechanism including a valve stem having a terminal end and a valve body, said stem normally extending axially away from the body, said valve mechanism being effective on axial movement of the stem toward the body to open a fluid flow path through the valve mechanism,

nipple means to hold the valve mechanism in closing relation of the passageway;

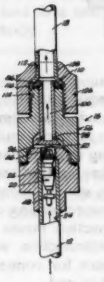
a fitting with a first axial through opening and said fitting having a first end and a second end, said fitting including means to connect to the means to hold the valve mechanism in closing relation of the passageway; and

said first end of said fitting being in fluid tight engagement with said means to hold; said fitting having an internal axially extending operating recess having a first end and a second end and extending axially away from said first end of said fitting, and said operating recess being about said stem;

said terminal end of said stem being normally at a first predetermined valve closed axial location within the recess spaced axially from the second recess end and movable in a direction axially away from the second end of the recess toward the first end of the recess to a second predetermined valve open axial location;

a valve operator of an axial length longer than the axial length of the through opening of the fitting from the recess to the second end of the fitting; said valve operator having a first end zone and a second end zone and comprising a tubular length defining a through passageway between the ends said first end zone defines a valve means, and said recess being in fluid communication with said through passageway;

said tubular length being sized for axial slidable movement in said axial through opening of said fitting and the first end



zone of the valve operator being at all times in use in the recess between the second end of the recess and the first predetermined axial location and adjacent the terminal end of said valve stem, and the second end zone of the valve operator being at all times in use exterior of the second end of the fitting;

means slidably captivating the first end zone of the valve operator in the recess for sliding axial movement of the first end zone of the valve operator in the recess between the first and second recess ends to move the valve stem toward the valve body axially from said first predetermined axial location to said second predetermined axial location to open the valve mechanism, said recess and said axial through passageway being in fluid communication with one another when said second end zone of said valve operator is between said first axial location and said second axial location;

stop means captivating and limiting axial movement of the first end zone of the valve operator to a range of movement in said recess including the axial distance between said first and said second predetermined axial locations and said stop means being defined by the second end of said fitting and said second end zone;

guard means and orienting means on the second end of the fitting to mate with an axially movable valve operating member to apply axial force to move the operator toward the valve stem to open the valve mechanism opening a

flowthrough path through said opening which is normally closed by said valve mechanism;

seal means between said fitting and said means to hold the valve mechanism in closing relation of the opening;

seal means are provided about said valve operator between said second end zone and the second end of said fitting; and

pipe means included in said device and said means to hold is fixedly secured to said pipe means and said passageway comprises an opening in said pipe means.

4,193,420

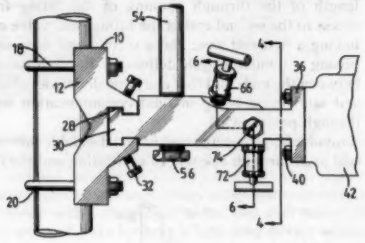
DIFFERENTIAL PRESSURE TRANSDUCER PROCESS MOUNTING SUPPORT AND MANIFOLD

John E. Hewson, 12226 Perthshire, Houston, Tex. 77024

Filed Mar. 2, 1978, Ser. No. 882,580

Int. Cl.[2] F16K *11/20*

U.S. Cl. 137—356 **23 Claims**



1. A mounting support for securing differential pressure sensing apparatus to a substantially rigid structure comprising:

a base member having attachment means for securing said base member to said substantially rigid structure, said base member defining mounting support connection means;

a support body having first and second connection means formed thereon, said first connection means receiving said differential pressure sensing apparatus;

said second connection means being adapted to establish structural interconnection with said mounting support connection means for connecting said support body to said base member; and

said support body defining high and low range pressure transmission passage means for communication with high and low range pressure transmission passages of said differential pressure sensing apparatus and providing sole structural support for said differential pressure sensing apparatus.

4,193,421

ELECTROMAGNETICALLY OPERATED VALVE UNIT

Naoji Sakakibara, Chiryu, and Nobuyuki Hashimoto, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

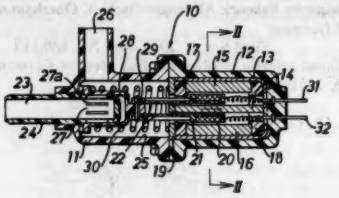
Filed May 10, 1978, Ser. No. 904,371

Claims priority, application Japan, May 12, 1977, 52-60240

Int. Cl.[2] F16K *31/08*

U.S. Cl. 137—625.33 **2 Claims**

1. An electromagnetically operated valve unit comprising a housing having inlet and outlet ports; valve means disposed within said housing for controlling the quantity of fluid flow from said inlet port to said outlet port; and a moving-coil linear motor associated with said valve means for operating said valve means in response to an input current from an electric control circuit; wherein said valve means comprises a tubular valve seat united with said inlet port and having an axial slot to permit the flow of fluid therethrough, and a cup-shaped valve member slidable on said tubular valve seat to control the opening area of said axial slot and being loaded by a spring to normally close said axial slot, and wherein said linear motor comprises an armature of magnetic material secured within said housing and having opposed inner faces thereon, a pair of permanent magnets secured to each of the opposed inner faces of said armature and having the same polarity of the opposed inner faces thereof, a core of magnetic material positioned between said magnets and aligned with said inlet port, a bobbin



of non-magnetic material movable on said magnetic core and operatively connected with said valve member, and a moving-coil wound on said bobbin and connected to said electric control circuit, said moving-coil producing electro-magnetic flux across magnetic flux of said magnets to provide a linear force on said bobbin.

4,193,422

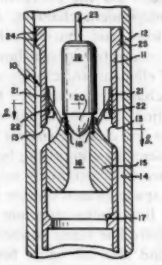
ANNULAR FLOW DIVERTER VALVE

Robert L. Rider, Walkersville, Md., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 24, 1978, Ser. No. 963,654

Int. Cl.[2] F16K *11/02*

U.S. Cl. 137—625.49 **4 Claims**



1. A valve for splitting a stream of fluid in a tube having a plurality of ports therein into two streams, one of which continues through the tube and the other of which continues outside the tube and for controlling the volume ratio of the outflowing streams comprising:

a toroidal baffle disposed in sliding engagement with the interior of said tube downstream of said ports,

means for closing said ports operable with and attached to said baffle,

a servomotor having a bullet-shaped plug thereon disposed in the tube with the plug facing the toroidal baffle, and

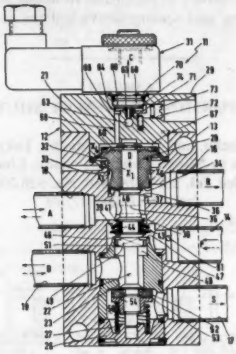
drive rods connecting the servomotor to the toroidal baffle, the servomotor being adapted to move the baffle into mating engagement with the bullet-shaped plug and simultaneously move the gates away from the ports in the tube and to move the baffle away from the bullet-shaped plug and simultaneously move the gates across the ports in the tube.

4,193,423

MULTIWAY VALVE

Kurt Stoll, Lenzhalde 72, Esslingen, and Gerhard Hihn, Schurwaldstrasse 7, Berkheim, both of Fed. Rep. of Germany

Continuation of Ser. No. 744,271, Nov. 23, 1976, abandoned.
This application Jun. 6, 1978, Ser. No. 913,099
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1975, 2553250
Int. Cl.[2] F16K *11/02, 31/165, 31/02*
U.S. Cl. 137—625.64 14 Claims



1. A 5-way, 2-working position valve which includes:

means forming an elongated valve body having a longitudinal central valve bore therein, said valve body also including five axially spaced tapped bores opening into said valve bore, said five tapped bores including two consumer bores, one pressure supply bore and two pressure venting bores, a first consumer bore and a first venting bore comprising a first pair of tapped bores, said first consumer bore and said one pressure supply bore comprising a second pair of tapped bores, said one pressure supply bore and the second consumer bore comprising a third pair of tapped bores, and said second consumer bore and the second venting bore comprising a fourth pair of tapped bores, said valve body also including means forming a first valve seat located between said first pair of said tapped bores, means forming a second valve seat located between said second pair of said tapped bores, means forming a third valve seat located between said third pair of said tapped bores, and means forming a fourth valve seat located between said fourth pair of said tapped bores, said second and third valve seats being axially separated along the longitudinal dimension of said central bore a predetermined distance;

means forming an axially adjustable regulating member positioned for movement along the longitudinal dimension of said central bore from a first working position to a second working position;

means forming a single diaphragm sealingly attached to a first end of said regulating member, said diaphragm including a portion forming an elastically deformable annular radial flex portion which is fixedly positioned in contact with said valve body so as to suspend said diaphragm in said valve bore and which defines a chamber between said first end of said regulating member and said valve body, and a portion which forms both an elastically deformable annular axial projection having a sealing lip extending radially so as to slidingly contact said valve bore and a radial end face, said end face of said single diaphragm being engageable with the means forming said first valve seat when said regulating member is in its second working position to prevent fluid communication between said first pair of said tapped bores;

means forming a further seal member attached near the second end of said regulating member, said seal member having a radial end face engageable with said means forming the fourth valve seat to prevent fluid communication between said fourth pair of said tapped bores when said regulating member is in its first working position;

a Vee-shaped double-seat sealing member attached to said regulating member at point separated from said annular axial projection portion of said single diaphragm and between said second and third valve seat-forming means, said double seat sealing member comprising a ring gasket having sealing lips around its radial outer periphery extending from a root portion, the sealing lips being elastically deformable in the directions of axial movement of the regulating member;

said Vee-shaped double-seat sealing member having an axial length equal to about said predetermined distance between said second and third valve seat-forming means so that said sealing lips will be capable of simultaneously contacting both said means forming said second valve seat and said means forming said third valve seat when said regulating member is between said first and second working positions, the respective lips of said sealing member contacting respective second or third valve seat-forming means and thus alternatively preventing fluid communication between said second pair of tapped bores or said third pair of tapped bores when said regulating member is respectively in its first and second working positions; and

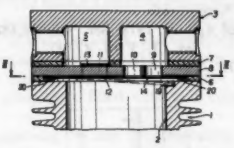
spring means positioned between said second end of said regulating member and said valve body for biasing said regulating member into its first working position, said second working position being established against the biasing of said spring by pressure medium flowing into said chamber between said first end of said regulating member and said valve body.

4,193,424

LAMINA VALVE FOR RECIPROCATING COMPRESSORS

Hans Hrabal, Vienna, Austria, assignor to ENFO Grundlagen Forschungs AG, Aargau, Switzerland

Filed Oct. 4, 1977, Ser. No. 839,189
Claims priority, application Austria, Oct. 6, 1976, 7423/76
Int. Cl.[2] F16K *15/14*
U.S. Cl. 137—855 3 Claims



1. In a compressor having a cylinder containing a cylinder bore, a cylinder head, a seating plate disposed between said cylinder and said head and having at least one port therein, a gasket of a first predetermined thickness disposed between said plate and said cylinder, and a lamina valve between said plate and said cylinder and lying inwardly of said gasket, said valve bearing against a surface of said seating plate for closing said port and being movable away from said port for opening same, the improvement wherein said valve comprises a lamina plate having opposed ends bridging said cylinder bore and being clamped in place at said ends, said lamina plate having a second predetermined thickness less than said first thickness and having resilient projections at at least one of said ends, said projections extending away from said surface of said seating plate and toward said cylinder, said projections having a thickness at least equal to said first thickness of said gasket and bearing against an end surface of said cylinder, said surfaces lying

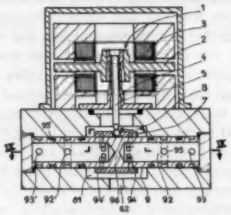
parallel to one another, whereby said projections compensate for any difference in thickness between said lamina plate and said gasket and further prevent any shifting of said lamina plate relative to said seating plate when said seating plate is clamped down over said cylinder.

4,193,425

ELECTROHYDRAULIC SERVO-VALVE

Geoffroy de la Bouillerie, Paris, France, assignor to Societe d'Optique, Precision Electronique et Mecanique-Sopelem, Paris, France

Filed Jul. 26, 1977, Ser. No. 819,614
Claims priority, application France, Aug. 20, 1976, 76 25314
Int. Cl.[2] F16K *31/10*
U.S. Cl. 137—861 **11 Claims**



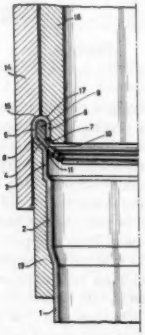
1. An electrohydraulic servo-valve comprising a body with a torque motor comprising: permanent magnet means associated with coils for receiving control currents and a movable armature connected to a spring attached to said body and to a spindle which oscillates in a plane; a liner fixed in said body having an outer cylindrical bearing surface and an inner duct for a fluid and at least one opening enabling a substantially radial flow of fluid from said inner duct; a sleeve having a cylindrical bore engaged with minimum clearance on said outer bearing surface of said liner, for controlling the effective area of said opening and an articulation connecting said sleeve to the end of said spindle to thereby oscillate said sleeve.

4,193,426

PLASTIC SOCKET PIPE PART

Adolf Irmer, Geeste, Fed. Rep. of Germany, assignor to Wavin B.V., Zwolle, Netherlands

Filed Apr. 21, 1978, Ser. No. 898,688
Int. Cl.[2] F16L *47/00*
U.S. Cl. 138—109 **3 Claims**



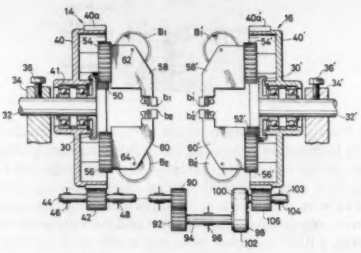
1. A plastic pipe socket part comprising a first widening, a second widening adjoining the first widening and having an internal diameter exceeding the diameter of the first widening, wherein the second widening extends into a third widening having substantially the same wall thickness but having an internal diameter exceeding the diameter of the second widening, an end part of said third widening being rebent in spaced but substantially parallel relation to an intermediate part thereof, sealing means of substantially J-configuration in cross section and having a head portion disposed in said space, and a sealing sleeve portion extending in the direction of said second widening, whereby to form a retaining ring, the terminus of the rebent portion being disposed in proximity to the plastic pipe socket part a distance less than the thickness of the head of said sealing means whereby to retain said head portion in said space while permitting said sealing sleeve portion to extend therefrom.

4,193,427

SELVAGE FORMING SYSTEM OF SHUTTLELESS LOOM

Akio Shindo, Fuchu, and Shinji Mizunaga, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jul. 20, 1978, Ser. No. 926,238
Int. Cl.[2] D03D *47/40*
U.S. Cl. 139—54 **8 Claims**



1. A selvage forming system of a shuttleless loom, forming first and second rigid selvage structures at both sides of a fabric, respectively, comprising:

first binding means for binding the first end portions of weft yarns constituting the first selvage structure of the fabric by twisting a first pair of binding yarns having inherent twist, putting the first end portion of each weft yarn between the two binding yarns;

second binding means for binding the second end portions of the weft yarns constituting the second selvage structure of the fabric by twisting a second pair of binding yarns having inherent twist in the same direction as said first pair, putting the second end portion of each weft yarn between the two binding yarns, said second binding means having the same construction as the first binding means and being located symmetrically opposite to said first binding means;

driving means for driving said first and second binding means so that the two binding yarns from the first binding means and the two binding yarns from said second binding means are twisted in the same direction so as to increase the inherent twist of each binding yarn.

4,193,428

LOOM HAVING AN ADJUSTABLE DEFLECTION BEAM

Hans Demuth, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Feb. 28, 1978, Ser. No. 882,114
Claims priority, application Switzerland, Mar. 9, 1977, 2933/77
Int. Cl.[2] D03D *49/22*
U.S. Cl. 139—114 **11 Claims**

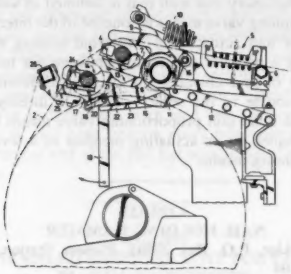
1. In a loom, the combination comprising

a frame having means for mounting a warp beam thereon;

a tensioning beam mounted on said frame for imparting

tension to a plurality of warp threads passing from a warp beam;

a deflection beam mounted on said frame upstream of said tensioning beam relative to the warp threads passing from the warp beam; and



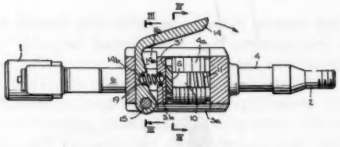
means mounted on said frame for moving said deflection beam to adjust said deflection beam independently relative to said tensioning beam.

4,193,429

PNEUMATIC TIRE INFLATION AND METHOD

André M. Devienne, Compiegne; Gilbert L. Igea, Clairoix, and Jean-Pierre L. Bernard, Melicocq, all of France, assignors to Uniroyal, Clairoix, France

Filed May 16, 1977, Ser. No. 797,149
Claims priority, application France, Jun. 24, 1976, 76 19262
Int. Cl.² B65B *3/04*
U.S. Cl. 141—4 **3 Claims**



1. A method of inflating a pneumatic tire equipped with an inflatable, annular, inner tube, inflatable tube means surrounding said inner tube, first valve means intercommunicating and connecting said inner tube and said tube means to one another, said first valve means being adapted to open to allow the flow of a pressurized pneumatic fluid therethrough from said inner tube to said tube means, said first valve means being further adapted to close in response to a drop in pressure in said tube means below the pressure existing in said inner tube, and second valve means operatively associated with said inner tube for facilitating the inflation of said inner tube and of said tube means via said first valve means, said method comprising the steps of:

(a) gradually inflating said inner tube via said second valve means at a specified intermediate rate and to a specified intermediate pressure that is below a specified ultimate pressure to which said inner tube is to be finally inflated to so that said tube means is also inflated to said specified intermediate pressure via said first valve means; and thereafter

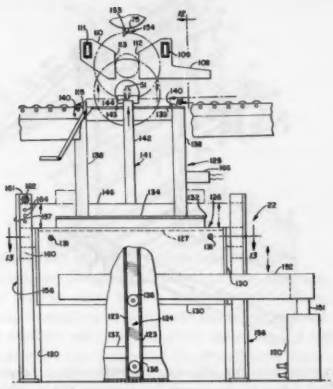
(b) suddenly continuing inflating said inner tube to said specified ultimate pressure via said second valve means at a rate in excess of said specified intermediate rate and at a pressure in excess of said specified intermediate pressure at which said inner tube is first gradually inflated to, thereby, cause said first valve means to close and terminate the communication between said inner tube and said tube means.

4,193,430

METHOD AND APPARATUS FOR FILLING CONTAINERS WITH A RELATIVELY VISCOUS MATERIAL

Forrest H. James, Jr., and Ira J. Silberman, both of Opelika, Ala., assignors to Diversified Products Corporation, Opelika, Ala.

Filed Oct. 18, 1977, Ser. No. 843,267
Int. Cl.² B65B *3/04, 43/54;* B65G *3/12*
U.S. Cl. 141—12 **15 Claims**



1. A method for filling a plurality of containers with a relatively viscous material, each of said containers having a filling opening in the periphery thereof, comprising:

(a) providing a plurality of containers to be filled;

(b) filling said containers with said viscous material, said filling comprising inserting a nozzle into each of said openings, said nozzle being in fluid flow communication with a dispensing hopper holding a supply of said viscous material, simultaneously, repetitiously agitating and vibrating said viscous material inside said hopper by independent means to induce a uniform and continuous flow of said viscous material from said hopper through said nozzle and into one of said containers, and vibrating said containers simultaneously with said simultaneous agitation and vibration of said viscous material to ensure that said containers are completely filled with said viscous material; and

(c) further comprising the step of transporting said containers on a plurality of carriers supported on a conveying means through said filling step wherein said inserting of said filling step comprises raising each of said carriers off of said conveying means until each of said openings engages one of said nozzles.

4,193,431

FENCE SLAT CUTTING METHOD AND APPARATUS

Paul R. Wood, 3602 N. 35th Ave., Phoenix, Ariz. 85017

Filed May 17, 1978, Ser. No. 906,821
Int. Cl.² B27C *5/00*
U.S. Cl. 144—134 C **2 Claims**

1. An apparatus for cutting the ends of slats for wooden fence use comprising:

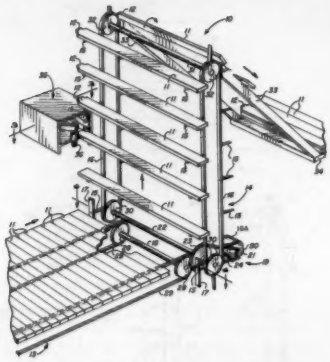
a first endless conveyor means for sequentially aligning and moving a plurality of juxtapositioned wooden slats along a given path onto a second endless laterally positioned conveyor means,

said second endless conveyor means aligned at the discharge

end of said first conveyor means for sequentially moving the slats along a given path in a horizontal position through an end forming means for the slats,

said end forming means for the slats compising a pair of spaced relatively adjustably positioned rotating cutter blade means for simultaneously machining between them different corresponding edges of like ends of the slats as they are sequentially moved by said second conveyor means in substantially a vertical direction between said cutter blade means,

said blade means being spaced from each other a distance less than the width of the slats with at least one of said cutter blade means being journaled on a pivotally



mounted arm for adjustably positioning it relative to the other cutter blade means for varying the machine design configuration of the end of the slats,

the blades of said cutter blade means rotating about a shaft substantially perpendicular to the direction of movement of the slats through said cutter blade means, whereby the surfaces of the slats are milled away by the blades,

a pair of electric motor means each connected to a different one of said blade means for rotation thereof independently of any means for moving said first and second conveyor means, and

means arranged at the end of said second conveyor means for receiving the slats machined by said apparatus.

4,193,432

SELF-STEERING APPARATUS FOR SHIPS

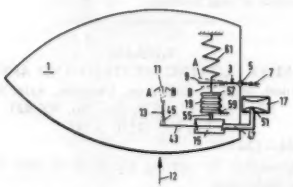
Jürgen Schuster, Munich, Fed. Rep. of Germany, assignor to C. Plath, Hamburg, Fed. Rep. of Germany

Filed Dec. 13, 1977, Ser. No. 860,091

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1976, 2656839

Int. Cl.[3] **B63H** *25/04*

U.S. Cl. 114—144 C **8 Claims**



7. An automatic steering device for a ship having a rudder, comprising:

means for sensing a change in the direction of an apparent wind relative to a desired ship's heading; and

a linear actuator coupled directly to said rudder for applying rudder corrections, said linear actuator being controlled by said wind sensing means, the stroke of said linear actuator being proportional to a change in the direction of the relative wind.

said linear actuator being a collapsible chamber having a movable end wall that is coupled directly to said rudder, and a stationary end wall that is fastened to said ship;

a proportioning valve means is coupled to the interior of said chamber and actuated by said wind sensing means, for creating a pressure differential between the interior and exterior of said chamber the pressure differential being proportionate to the sensed change in direction of the apparent wind said proportioning valve means being further coupled by an actuating member to a lever of said wind sensing means.

4,193,433

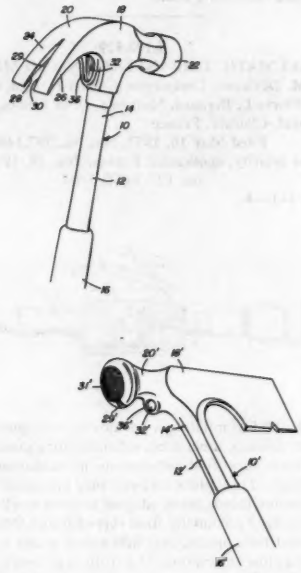
NAIL HOLDING HAMMER

Jack R. Sickler, P.O. Box 20803, Pioneer Station, Billings, Mont. 59104

Filed Jun. 20, 1978, Ser. No. 917,304

Int. Cl.[2] **B25C** *1/00*

U.S. Cl. 145—30 R **2 Claims**



1. In combination with a claw hammer including an elongated handle and an elongated transverse head on one end of said handle with said handle projecting outwardly from one side of said head, one end of said head including an endwise outwardly facing abutment surface generally centered relative the longitudinal center axis of said head and for impacting with a nail to be driven into a workpiece, the other end of said head including endwise outwardly divergent and projecting curved claws curving outwardly from said one side of said head toward the other end of said handle and defining an inwardly tapering crotch therebetween terminating inwardly adjacent said center axis, said head also including a lateral projection extending outwardly of said one side defining a seat surface spaced inwardly of said claws, facing along a path extending outwardly of said other end of said head through said crotch and adapted to receive the head of a nail thereagainst extending along said path, said crotch being positioned relative to said

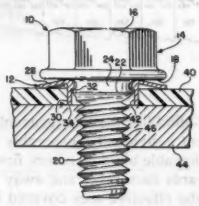
path for wedgingly receiving the midportion of the shank of a nail extending along said path and having its head end seated against said seat surface, said seat surface being substantially planar and normal to said path, said head defining a substantially V-shaped curb projecting outwardly from said seat surface, bounding the latter from three adjacent sides and opening away from said other end of said handle, said curb including a rounded apex portion and inner surfaces disposed at substantially right angles to said seat surface and said curb being free of any portions thereof overlying the area of said seat surface bound by said curb which might act to "catch" on a head portion of a nail engaged with said seat surface to restrict movement of said head portion away from said seat surface after the remote end of the nail has been initially forced into a workpiece.

4,193,434

PREASSEMBLED FASTENER UNIT FOR CLAMPING PLASTIC WORKPIECES

David P. Wagner, Geneva, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 10, 1978, Ser. No. 932,744
Int. Cl.² F16B *39/26*
U.S. Cl. 151—38 **13 Claims**



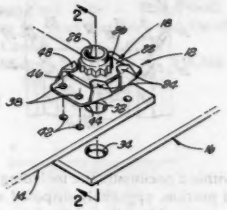
1. A fastener unit including a washer member and a headed rotary threaded fastener which is preassembled with said washer, said fastener unit adapted for use with an upper, apertured, workpiece of predetermined thickness which is subject to cold flow or creep in load bearing applications, said washer member including an axially extending sleeve of substantially uniform wall thickness and predetermined axial extent, a radially outwardly and downwardly directed spring flange extending from the uppermost extremity of the sleeve, the outermost periphery of said flange spaced downwardly a predetermined distance from the innermost periphery, said outermost periphery of said flange spaced upwardly a predetermined distance from the lowermost extremity of said sleeve, the thread impressions on the shank of the rotary threaded fastener being of predetermined crest and root diameters, the uppermost extremity of said thread impressions being spaced a predetermined axial distance from the lower bearing surface of the head to create an unthreaded shank portion, said distance being less than the predetermined axial extent of the sleeve so that at least a portion of the thread impression extends upwardly within the sleeve when in preassembled condition, the inner periphery of the sleeve being of a diameter greater than the crest diameter of the thread impression on the shank, an annular protuberance formed on said unthreaded shank portion having a predetermined height said protuberance presenting a diameter greater than said crest diameter, a radial inwardly extending protuberance means of very limited axial extent formed adjacent the juncture of the sleeve with the flange of said washer and creating a constricted aperture in the sleeve of a diameter less than the diameter of the annular protuberance on the shank but greater than the crest diameter of the thread impression, the predetermined length of said unthreaded shank portion being substantially equal to the height of the annual protuberance of the fastener plus the axial extent of the washer protuberance.

4,193,435

FLOATING NUT RETENTION SYSTEM

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; James F. Charles, Norco, and Harry A. Theakston, Tustin, both of Calif.

Filed Aug. 31, 1978, Ser. No. 938,582
Int. Cl.² F16B *37/06*
U.S. Cl. 151—41.76 **1 Claim**



1. A floating nut retention system comprising:

a nut having an internally threaded central aperture;

an inner retainer plate having a flat bottom surface and an opening through said plate, said nut being secured to said inner retainer plate with said nut aperture and said inner retainer plate opening being fixedly aligned therewith,

an outer retainer member formed of a base plate having ends, an opening therein and a flat planar surface in said base plate disposed adjacent to the bottom surface of said inner retainer plate, said base plate having a pair of opposed side edges;

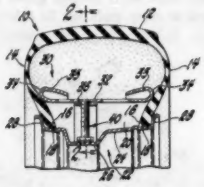
securing means for retaining said inner retainer plate adjacent to said outer retainer member with said opening substantially aligned while enabling the inner retainer plate to float with respect to said outer retainer member, said securing means being provided by a pair of wall structures integrally formed at each of said opposed side edges of said base plate, each wall structure being formed by an upwardly extending leg having an arcuately curved inner surface and extending generally transverse to the plane of said base plate with the maximum distance between said opposing curved surfaces at the center thereof and a foot portion on each leg extending inwardly toward the opposing wall structure and over said inner retainer plate thereby limiting movement of said inner retainer plate in the direction perpendicular to the plane of said base plate, said inner retainer plate being tapered from a maximum width at the center thereof to a minimum width at the ends thereof, said maximum width exceeding the distance between the upstanding legs of said wall structures at each end of said base plate to thereby prevent said inner plate from being removed from the outer retainer member when moved in a plane parallel to the plane of said base plate;

and load bearing surface means provided by said curved inner surfaces and adapted to engage the side edges of the inner retainer plate, said outwardly curved side edges of the inner retainer plate being curved to mate with the load bearing surfaces whereby the area of restraining surface increases with increasing torque and adapted to provide a significant bearing contact area when torque is applied during the installation or removal of a bolt extending through said openings of the inner retainer plate and said outer retainer member in threaded engagement with the nut.

4,193,436
RUN-FLAT TIRE HAVING INTERNAL SUPPORT MEANS

Roy S. Cataldo, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 27, 1978, Ser. No. 881,165
Int. Cl.[2] B60C 17/04
U.S. Cl. 152—158 5 Claims

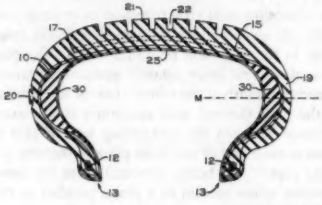


1. For use within a pneumatic tire including a carcass having an outer tread portion, oppositely disposed sidewalls, a bead adjacent each inner sidewall end, and an annular opening between the beaded ends, on a vehicle wheel having an annular drop center rim with outer rim flanges formed on oppositely disposed sides thereof for retaining said beaded ends of said tire in sealing engagement therewith when said tire is inflated; a tire stabilizer comprising load support ring means concentric with said rim and disposed within said carcass intermediate said oppositely disposed sidewalls and radially outwardly of said rim, and a plurality of spaced substantially radially oriented support means, said support means being arcuately spaced from one another having open space therebetween, each of said support means having one end thereof operatively connected to said drop center rim and the other end thereof operatively connected to said load support ring means and cooperating with said wheel to provide the sole radial support of ring means and for retaining the latter in position to support said outer tread portion should said tire become deflated.

4,193,437
SELF SUPPORTING TIRE

Joe A. Powell, Norton, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 16, 1977, Ser. No. 833,789
Int. Cl.[2] B06C 17/00; C08L 7/00, 9/00, 9/06
U.S. Cl. 152—330 RF 12 Claims



1. In a self supporting tire comprising two spaced inextensible beads, a ground contacting tread portion, a pair of individual sidewalls extending radially inward from the axial outer edges of said tread portion to join the respective beads, a carcass portion, and a pair of integral inner sidewalls disposed inwardly of said carcass portion and extending radially outward from a point near said beads to a point beyond the axial outer edges of said tread, the improvement consisting in the inner sidewall being formed of a nonstaining composition comprising:

(a) from about 50 to about 95 parts by weight of at least one elastomer selected from the group consisting of natural rubber and cis-polyisoprene,

(b) from about 5 to about 50 parts by weight of at least one elastomer selected from the group consisting of styrene-butadiene and cis-polybutadiene,

(c) from about 25 to about 80 parts by weight of carbon black per 100 parts by weight of rubber, wherein said carbon black has a dibutyl phthalate absorption value greater than about 80 and a particle size less than about 50 milli-microns, and

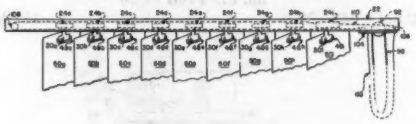
(d) sufficient curing agents to effect vulcanization;

wherein said inner sidewall composition when vulcanized has a 300% modulus of at least 1800 psi, a hardness of at least 60 Shore A durometer, and a heat buildup value less than about 60° F. as measured by the Goodrich Flexometer.

4,193,438
VERTICAL-BLIND-LIKE MODULAR ASSEMBLY

Ronald Pastore, Bishop Rd., Bedford, N.Y. 10506

Filed Sep. 13, 1978, Ser. No. 941,943
Int. Cl.[2] E06B 9/26
U.S. Cl. 160—166 A 17 Claims



1. A vertical-blind-like modular assembly comprising a plurality of adjacent individually removably mountable substantially parallel alignable blind members; first means for moving said blinds towards each other and away from each other in order to vary the effective area covered by said plurality of adjacent blinds; a plurality of longitudinally movable removably mountable blind carrier members, a channel means for removably retaining each of said blind carrier members; each of said blind carrier members comprising a pivotally mountable removable holder vertically extending therefrom with respect to the direction of longitudinal movement of said blind carrier members and a common alignable aperture longitudinally extending through each of said carrier members; each of said blind holders including a hook-like portion; each of said blind members including an aperture therein adjacent one end thereof for enabling insertion of said hook-like portion therethrough for removably retaining said blind member thereon while enabling both pivotal and longitudinal movement thereof; a plurality of removably mountable link members interconnecting said plurality of carrier members for enabling linked movement thereof; a common shaft member extending through said aligned longitudinal aperture in each of said plurality of carrier members; said linked carrier members being longitudinally slidably movable along said common shaft by said first means; said shaft including a common longitudinally extending keyway; each of said carrier members including a first bevel gear means mountable in said keyway for simultaneous rotation therewith and a second bevel gear means disposed in meshing relationship with said first bevel gear means and substantially normal thereto for driving rotation thereby as said common keyway is rotated with said common shaft; said second bevel gear means being operatively connected to said blind holder for simultaneously rotating said blind holder with said second bevel gear means for pivoting said blind removably retained thereon as said second bevel gear means rotates; a removably mountable common control housing; a common gear means disposed at one end of said common shaft in said common control housing; a common spring-biased slip clutch member disposed in said control housing; a worm gear means disposed in said control housing in meshing relationship with said common gear means for driving said common gear means

as said worm gear means is rotated; and a cord-like member removably mountable on said slip clutch member for rotating said slip clutch member by movement thereof, said cord-like member and slip clutch member comprising a pulley, said spring-biased slip clutch member being removably engageable with said worm gear means and normally spring-biased into engagement therewith, said slip clutch member being automatically disengageable when said slip clutch member is rotated while rotation of said common shaft keyway is prevented by prevention of rotation of any of said second bevel gear means and automatically engageable into said engagement when said slip clutch member is rotated and said prevention of rotation is not present, whereby each of said blinds may be individually replaced in situ without disassembling said entire assembly and said plurality of blinds will maintain their substantially parallel alignment even during attempted pivotal movement while an obstruction prevents such pivotal movement of any one of said plurality of blinds.

4,193,439

DEVICE FOR OPERATING HATCH COVERS OR THE LIKE COMPOSED OF PANELS

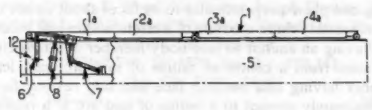
Henri Kummerman, Geneva, Switzerland, assignor to MacGregor International S.A., Basel, Switzerland

Filed Dec. 7, 1977, Ser. No. 858,349

Claims priority, application France, Dec. 9, 1976, 76 37111; Nov. 30, 1977, 77 36151

Int. Cl.[2] B63B *19/20*

U.S. Cl. 160—188 **20 Claims**



1. Operating apparatus for a folding cover system for a shipboard hatch coaming or the like having two parallel side walls and two end walls, the system including at least three rectangular cover panels, each panel being hingedly connected at one edge to an adjacent edge of the next panel, and a first one of the panels being hingedly connected at the edge opposite said one edge to a fixed support adjacent to one end wall of the coaming, the operating apparatus being actuable for moving the panels between a covering position in which the cover panels rest substantially in a common plane on the rim of the coaming and a stowage position in which the panels are folded together about said hinged connections to a substantially upright position adjacent to said one end wall of the coaming and including operating means for pivoting the first panel about the fixed support to an approximately upright position, thereby at least partially folding the second panel against the first panel, and means for folding the third cover panel about its hinged connection with the second panel, wherein the means for folding the third panel comprises:

at least one lever mounted for pivoting about an axis adjacent and parallel to said one end wall of the coaming, the lever having a bearing means with a surface spaced from the pivot axis for slidably contacting the under surface of a portion of the third cover panel at a location spaced from the hinged connection between the third and second panels when said first and second panels are in said at least partly folded upright position, and

actuating means, hingedly connected to the lever at an actuating point spaced from the pivot axis, for pivoting the lever into contact with the third panel and then folding said panel upward toward the folded second panel about the hinged connection between said panels, with the surface of said bearing means being free to slide against the under surface of said portion of the third panel as said third panel is being folded upward against the second panel.

4,193,440

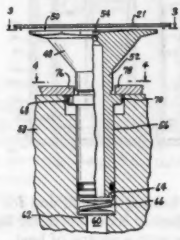
BELT-COOLING AND GUIDING MEANS FOR THE CONTINUOUS BELT CASTING OF METAL STRIP

Herbert J. Thorburn, and John A. Tracy, both of Kingston, Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed Sep. 1, 1978, Ser. No. 938,885

Int. Cl.[2] B22D *11/06*

U.S. Cl. 164—432 **16 Claims**



1. A belt cooling and guiding unit for continuous casting apparatus where liquid metal is cast between a pair of movable heat-conducting belts to discharge as solidified strip, said apparatus including a base structure having passages for delivering liquid coolant to a multiplicity of such units which collectively face the reverse surface of at least one belt to provide a layer of liquid coolant at said surface, comprising means providing a substantially flat guiding face having a hexagonal contour around a transverse axis and apertured for projecting liquid coolant against said reverse belt surface, means for supporting said first-mentioned means in registration with one of said base passages for coolant supply, said supporting means including means resiliently urging said first-mentioned means toward said belt surface, and mutually engageable retaining elements respectively associated with said first-mentioned means and arranged to be held with the base structure, said first-mentioned means being rotatably and longitudinally movable relative to said axis and said elements being constructed and arranged so that from a position of engagement to hold the first-mentioned means against axial displacement by the resilient means, said elements can be disengaged by depressing the first-mentioned means against said resilient means and rotating it whereby it can be removed axially, said hexagonal face being shaped so that it and like hexagonal faces can completely cover a belt-facing area with narrow openings between adjacent hexagonal edges for return of liquid coolant projected against the belt surface through the hexagonal faces, said retaining elements being mutually shaped so that in their engaged, holding position the aforesaid unit is held with its hexagonal face edges in closely aligned spacing next to the said adjacent hexagonal edges of said like hexagonal unit faces, and so that when the elements are disengaged by depressing and rotating the first-mentioned means, the hexagonal face edges of the aforesaid unit are in another position for like closely aligned spacing with the adjacent hexagonal edges of the adjacent hexagonal unit faces, to permit axial removal of the aforesaid unit through the hexagonally defined opening between the hexagonal faces of the adjacent units.

4,193,441

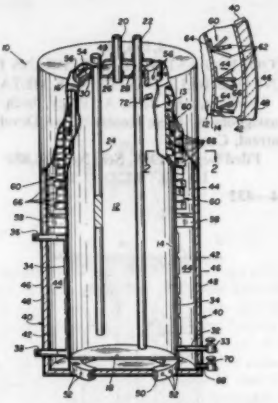
VARIABLE CAPACITY THERMAL STORAGE SYSTEM EMPLOYING THERMAL SWITCHING

Robert P. Scaringe, 1709 Tibbits Ave., Troy, N.Y. 12180

Filed Dec. 30, 1977, Ser. No. 865,943

Int. Cl.[2] F28D *21/00*

U.S. Cl. 165—32 **16 Claims**



1. In a device for heating a liquid and for storing thermal energy to maintain a heated condition of the liquid, said device being adapted for use with a source of heat,

a reservoir for holding a quantity of the liquid to be maintained in a heated condition and having a thermally-conductive outer wall,

heat exchanger means connected with the source of heat and positioned exterior to and in thermal communication with at least a portion of said reservoir to enable the transfer of thermal energy from the source of heat to the liquid in said reservoir so as to cause the elevation of the temperature of the liquid,

and a thermal medium positioned against at least a portion of said reservoir outer wall in direct thermal communication with both said reservoir and said heat exchanger means, said thermal medium being initially in a low thermal conductivity solid state in which said medium acts as a thermal insulator and having a triggering temperature at which said medium reversibly melts to a substantially increased thermal conductivity liquid state while absorbing thermal energy and storing the same as the latent heat of fusion of said medium,

such that the continued transfer of additional thermal energy through said heat exchanger means to the liquid after the temperature of the liquid in the reservoir has been elevated to said triggering temperature results in the absorption and storage in said thermal medium of said additional thermal energy as the latent heat of fusion thereof so as to substantially maintain the liquid at said triggering temperature, whereby when the temperature of the liquid drops below the triggering temperature of said medium the said additional energy stored in said medium at the latent heat of fusion thereof is then released and transmitted to the liquid so as to maintain the liquid at substantially the triggering temperature of the medium.

4,193,442

DUAL BIMETAL RELIEF VALVE

David R. Vian, 849 S. Church St., Lodi, Calif. 95240

Filed Mar. 19, 1979, Ser. No. 21,747

Int. Cl.[2] G05D *23/08*

U.S. Cl. 165—35 **10 Claims**

6. in combination with a fluid cooling element and a barrel-type fluid filter in a closed circuit system having a fluid reservoir, an apparatus for connecting said fluid reservoir with said filter and said cooling element, said apparatus comprising:

a body member for sealably coupling said filter to said fluid reservoir; and a curvilinear leaf member comprising a strip of resilient material having an obverse face and a reverse face; said body member comprising:

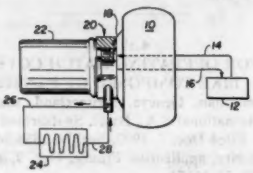
(a) means defining passage centrally located therein between said filter element and said fluid reservoir;

(b) an outlet port coupled to said filter for directing fluid from said body member to said filter;

(c) a recess formed in said body member about said central passage in fluid communication in said outlet port;

(d) a first inlet port having a first valve seat in fluid communication with said recess; and

(e) a second inlet port having a second valve seat in fluid communication with said recess, said second valve seat



being disposed to face said first valve seat on opposing sides of said recess;

said leaf member comprising means extending substantially along one plane perpendicular to its faces about an arc of approximately three-quarters of a circle within said recess and having an anchor to said body member at a first end displaced from a center of radius of said arc, said leaf member having said obverse face and said reverse face approximately normal to a radius of said arc at a region approximately three-quarters of a circle radially displaced from said anchor, said obverse face and said reverse face defining opposing first and second valve gates, said first valve gate being disposed to abut to said first valve seat and said second valve gate being disposed to abut to said second valve seat upon displacement of said first gate away from said first valve seat.

4,193,443

HEAT EXCHANGER FOR COOLING SYSTEM COMPRESSED AIR DEHUMIDIFIERS

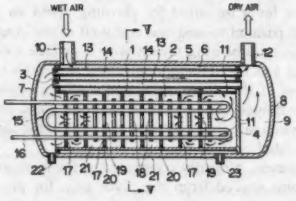
Kazuyuki Nanaumi, and Koji Baba, both of Susaka, Japan, assignors to Orion Machinery Co., Ltd., Nagano, Japan

Filed Aug. 9, 1978, Ser. No. 932,323

Claims priority, application Japan, Nov. 28, 1977, 52/158289[U]; Dec. 29, 1977, 52/176709[U]

Int. Cl.[2] F28B *1/00*

U.S. Cl. 165—66 **6 Claims**



1. A heat exchanger for cooling system compressed air dehumidifiers comprising: an inner body; an outer body forming a casing for said heat exchanger; a precooling passage

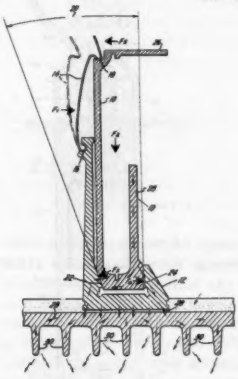
formed between said inner body and said outer body; a dehumidifying passage defined within said inner body; a cooler within said dehumidifying passage, said cooler being mounted within said inner body eccentrically relative to said outer body which forms the casing of said heat exchanger; an air supply port provided in said outer body through which compressed air flows into said precooling passage from one end thereof; a communicating opening provided in said inner body through which compressed air flowing into said precooling passage is led into said dehumidifying passage from one end thereof; an air discharge port provided in said outer body; and a plurality of heat transmitting pipes extending through the interior of said precooling passage and forming air flow passages which guide compressed air from said dehumidifying passage to said air discharge port provided in said outer body through ends thereof closer to said port; said heat transmitting pipes operating to effect heat exchange between the air flowing into said precooling passage through said air supply port and air which flows through said heat transmitting pipes from said dehumidifying passage to said discharge port.

4,193,444

ELECTRICAL MOUNTING MEANS FOR THERMAL CONDUCTION

Robert L. Boyd, Woodcliff Lake; David C. Hamilton, Ridgewood; Wilmer E. Wood, Fair Lawn; Joseph Fleming, Ramsey, all of N.J., and Raymond Wegmann, Stroudsburg, Pa., assignors to Ramsey Controls, Inc., Mahwah, N.J.

Filed Feb. 16, 1978, Ser. No. 878,341
Int. Cl.[2] H01L *23/40*
U.S. Cl. 165—76 **15 Claims**



1. An electrical mounting and thermal conduction means, comprising:

(a) a support element having a generally U-shaped interior surface, the base of the exterior of said support element being in thermal contact with a heat dissipating surface;

(b) a carrier element having a generally U-shaped exterior surface, said surface having a cross-section of smaller dimension than that of said U-shaped surface of said support element, said carrier element being nestable within said support element; and

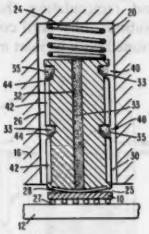
(c) locking means removably securable to adjacent arm members of each of said support and carrier elements for maintaining said support and carrier elements in selective securement to each other.

4,193,445

CONDUCTION COOLED MODULE

Richard C. Chu; Un-pah Hwang, and Robert E. Simons, all of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,904
Int. Cl.[2] H01L *23/42*
U.S. Cl. 165—79 **12 Claims**



1. In a conduction cooled module for cooling electronic chips having at least one piston located in a housing cylinder forming an annular interface between the piston wall and the corresponding cylinder wall and having an end of each piston bearing against a corresponding chip to be cooled forming an interface therebetween;

said piston having a top and bottom surface and an outer wall and an opening extending from the top to the bottom surface;

radial grooves extending from the bottom end of the opening to near the periphery of the bottom surface of said piston;

at least one circumferential groove located in the outer wall of said piston;

vertical grooves extending downward from said circumferential grooves until they intercept another circumferential groove or terminate near the bottom surface of said piston which contacts the chip;

a low melt point heat conductive material located in the opening in said piston;

a ring of said low melt point heat conductive material located in each of said circumferential grooves;

means for heating the module above the melting temperature of said material so that said material flows from the opening in said piston along said radial grooves and fills the interface between said piston and chip and flows from said circumferential grooves into said annular interface and along said vertical grooves and fills the annular interface between said piston and cylinder wall, thereby lowering the interface resistances and enhancing the cooling heat transfer.

4,193,446

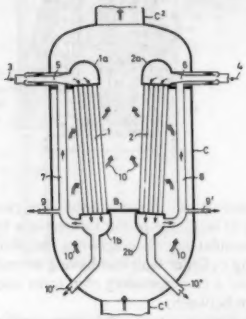
INTERMEDIATE STEAM SUPERHEATER

Ingemar Greis, Sturefors, and Lars-Olof Ingesson, Linghem, both of Sweden, assignors to Stal-Laval Apparat AB, Linkoping, Sweden

Filed Aug. 18, 1977, Ser. No. 825,775
Claims priority, application Sweden, Aug. 20, 1976, 7609256
Int. Cl.[2] F28B *9/02*
U.S. Cl. 165—108 **1 Claim**

1. A fluid heater comprising a casing having an inlet and an outlet and through which via the casing a flow of fluid to be heated is passed, said casing containing at least one heat exchanger comprising a bundle of tubes forming unrestricted flow passageways and having an inlet manifold for one of their ends and an outlet manifold for the other of their ends, the inlet manifold having an inlet for steam and the outlet manifold having discharging means for discharging steam condensate therefrom, so that the steam passes through the bundle of tubes to heat the fluid passed through the casing with steam conden-

sate forming in the tubes flowing through the tubes and outlet manifold to said discharging means, said heat exchanger normally being subject to substantially complete steam condensation in some of its said tubes and to free passage of uncondensed steam through others of its tubes; wherein the improvement comprises a recirculating means for sucking steam from said outlet manifold and without flow restriction forcing it into said inlet manifold at a flow rate recirculating the steam through said bundle of tubes at a flow rate flushing condensate from the tubes and recirculating the uncondensed steam through the tubes substantially until condensed, said heat exchanger being positioned with its inlet manifold higher than its



outlet manifold, and said tubes extending downwardly from the inlet manifold to the outlet manifold, said outlet manifold forming means for separating steam from said condensate and connecting the separated steam to said recirculating means and said condensate to said discharging means, said recirculating means including a means for discharging an amount of steam from the recirculating steam and which is small in volume as compared to the volume of the recirculating steam, thereby reducing the concentration of any non-condensable gas in the recirculating steam and which gas may have been included by the steam supplied to the inlet of said inlet manifold of the heat exchanger.

4,193,447

HEAT EXCHANGER FOR A HIGH TEMPERATURE REACTOR

Robert Fah, Seuzach, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 19, 1977, Ser. No. 862,003

Claims priority, application Switzerland, Dec. 21, 1976, 16079/76

Int. Cl.[2] **F28F** *9/22*; **F28B** *1/02*; **G21C** *19/28*

U.S. Cl. 165—145 **6 Claims**

1. A heat exchanger for a high temperature reactor comprising

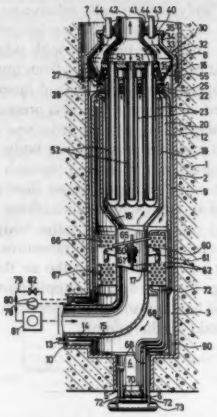
a casing;

a first heating surface including a tube plate spaced from said casing to define a gap therebetween, a nest of blind tubes extending within said casing and terminating in said tube plate, and a plurality of inner tubes, each said inner tube extending concentrically within a respective blind tube to define a flow path having parallel sections for a flow of a secondary gas;

a feed pipe disposed coaxially of said next of blind tubes for supplying a flow of hot primary gas over said nest of blind tubes for heat exchange with the secondary gas, said pipe having a funnel-shaped widened portion connected to said casing;

a jacket extending from said tube plate in concentric spaced relation to said casing and to said feed pipe to define an annular passage for the flow of primary gas downstream of said gap and said first heating surface; and

a second heating surface located between said feed pipe and said jacket in said annular passage below said widened



portion for heating a working medium in heat exchange relation with the flow of primary gas.

4,193,448

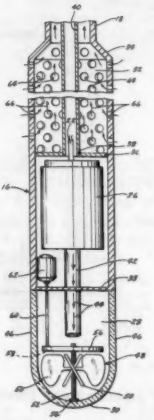
APPARATUS FOR RECOVERY OF PETROLEUM FROM PETROLEUM IMPREGNATED MEDIA

Calhoun G. Jeambey, 7485 E. Kenyon Ave., Denver, Colo. 80237

Filed Sep. 11, 1978, Ser. No. 941,122

Int. Cl.[2] **E21B** *43/24*

U.S. Cl. 166—60 **6 Claims**



1. An apparatus for the recovery of petroleum from petroleum impregnated media having an opening therein, comprising,

an elongated shell for insertion into said opening, said shell having a trailing end and a leading end, and being connected at its trailing end to an oil passage conduit

said elongated shell including a microwave dispersing chamber and a microwave transparent portion around said chamber, said shell being adapted for insertion into said opening,

a microwave generating means,

guide means for guiding microwaves from said microwave generating means into said microwave dispersing chamber

a microwave mixer comprising a plurality of movable microwave deflecting blades positioned to intercept, deflect and disperse substantially all microwaves through the microwave transparent portion of said shell and substantially throughout the surrounding oil impregnated media adjacent said transparent portion of said shell

said shell including a petroleum recovery chamber and a plurality of openings through said shell for communication of heated pertroleum from said media into said recovery chamber.

4,193,449

VALVE OPERATING CIRCUIT

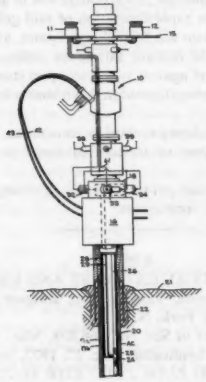
Glen E. Lochte, Houston, and Lionel J. Milberger, Spring, both of Tex., assignors to FMC Corporation, San Jose, Calif.

Filed Jun. 5, 1978, Ser. No. 912,275

Claims priority, application United Kingdom, Aug. 12, 1977, 33848/77

Int. Cl.[2] **E21B** *33/03, 43/00*

U.S. Cl. 166—72 **13 Claims**



1. A hydraulic valve operating circuit for opening and closing a downhole safety valve, said circuit connected for use with a source of pressurized hydraulic fluid and a downhole safety valve mounted in a petroleum well having a wall, said safety valve including a valve actuator having an inlet port, said well including block valves mounted to a christmas tree atop said well to connect the safety valve actuator to an outside hydraulic presssure source and to a pressure sink while isolating the safety valve from the outside environment, said circuit comprising:

a normally closed block valve connected between said source of hydraulic fluid and said inlet port of said safety valve actuator;

means for mounting said block valve in the wall of the well between the inside of said well and the outside of said well;

means for opening said block valve in response to an increase in pressure from said source of fluid; and

valve means for relieving the fluid pressure at said inlet port of said actuator when said block valve is closed, said valve means being coupled to said inlet port of said safety valve actuator.

4,193,450

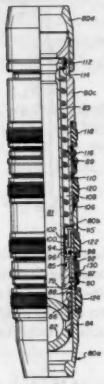
SURFACE CONTROLLED SUBSURFACE SAFETY VALVE

Ernest P. Fisher, Jr., Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Nov. 13, 1978, Ser. No. 960,168

Int. Cl.[2] **E21B** *43/12*

U.S. Cl. 166—155 **10 Claims**



1. A surface controlled subsurface safety valve comprising:

housing means for defining a flow path,

closure means for controlling flow through said flow path,

operator means longitudinally movable with respect to said housing means for moving said closure means and having a first position wherein said closure means closes said flow path and having a second position wherein said closure means opens said flow path,

control fluid pressure responsive means for moving said operator means from said first position to said second position when affected by fluid pressurized above a selected value,

balance fluid pressure responsive means for pressure balancing said operator means with respect to hydrostatic fluid pressure,

resilient urging means for urging said operator means longitudinally within said housing means to move said closure means to its first position,

a control fluid pressure chamber associated with said control fluid pressure responsive means for receiving control fluid,

a variable capacity balance fluid pressure chamber associated with said balance fluid pressure responsive means for receiving balance fluid,

a fixed capacity zone exposed to balance fluid pressure,

means for providing a fluid seal between said control fluid pressure chamber and said variable capacity balance fluid pressure chamber and said fixed capacity zone exposed to balance fluid pressure, and

means for directing well bore pressure only to said variable capacity balance fluid pressure chamber rather than to said control fluid pressure chamber.

4,193,451

METHOD FOR PRODUCTION OF ORGANIC PRODUCTS FROM KEROGEN

Thonet C. Dauphine, Acton, Mass., assignor to The Badger Company, Inc., Cambridge, Mass.

Continuation of Ser. No. 696,976, Jun. 17, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 845,504

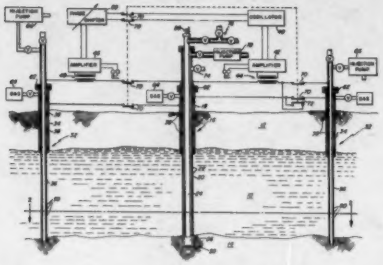
Int. Cl.[2] **E21B** *43/24, 43/26*

U.S. Cl. 166—248 **11 Claims**

1. The method of producing organic liquid and gaseous

products having low pour points from kerogen contained in a subsurface body of oil shale comprising the steps of:

heating regions of said kerogen in said body to temperatures in the range between 200° C. and 360° C. where kerogen will convert to liquid and gaseous products by subjecting



said oil shale to a time varying electric field while producing substantial pressure in fissures produced in said body;

allowing sufficient time to pass to allow substantial conversion of said kerogen to said products; and

collecting said products through said fissures.

4,193,452

WATERFLOODING EMPLOYING THICKENED AQUEOUS LIQUIDS

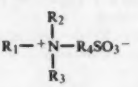
Peggy M. Wilson, and Julie Pao, both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 7, 1978, Ser. No. 931,590

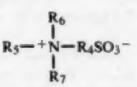
Int. Cl.[2] E21B *43/22*

U.S. Cl. 166—274 **6 Claims**

1. In a method for the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems wherein an aqueous fluid is introduced into the reservoir via said injection system to displace oil to said production system, the improvement comprising employing as at least a portion of the fluid introduced into said injection system an aqueous liquid which is thickened by the addition of a C_5–C_8 alkanol and a surface-active amphoteric sulfonate characterized by the formula:



or



wherein:

R_1 is a hydrocarbyl group containing from 8 to 26 carbon atoms,

R_2 and R_3 are each independently a hydrocarbyl group containing from 1 to 8 carbon atoms or an alkoxy group containing from 2 to 10 carbon atoms and having a ratio of carbon atoms to oxygen atoms within the range of 2 to 3,

R_4 is an aliphatic group containing from 1 to 6 carbon atoms, and

R_5, R_6, and R_7 are aliphatic hydrocarbyl groups containing in combination a total number of carbon atoms within the range of 17 to 24 and at least two of R_5, R_6, and R_7 containing at least 8 carbon atoms,

said alkanol being present in a concentration to provide a ratio, R_a, of the volume amount of alkanol to the weight amount of amphoteric sulfonate within the range of 0.1–0.6.

4,193,453

METHOD FOR CONSOLIDATING SAND OR WATER CONTROL IN SUBTERRANEAN FORMATIONS

Herbert S. Golinkin, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 807,969, Jun. 20, 1977, Pat. No. 4,137,182. This application Jul. 26, 1978, Ser. No. 928,110

Int. Cl.[2] E21B *33/13*

U.S. Cl. 166—295 **1 Claim**

1. A method for water control in subterranean formations or and consolidating sand in incompetent subterranean formations comprising the steps of:

(1) contacting the said subterraneous formations with an aqueous fluid composition containing water, a soluble polymer selected from the group consisting of the polymeric salts of ammonia, sodium and potassium salts of acrylamide: methacrylate copolymer, said copolymer, having a weight ratio of from about 50 to 90 weight percent acrylamide and from about 10 to 50 weight percent methacrylate, and said copolymer having a molecular weight sufficient to provide a brine viscosity of at least 1.8 centipoises (measured in Cannon viscometer) when dissolved in a concentration of about 500 ppm in an aqueous brine containing from about 3650 to 3750 ppm sodium chloride and from about 365 to 375 ppm calcium chloride made with deionized water, a chromium ion of a water-soluble trivalent chromium salt in an amount sufficient to cross-link said copolymer, said copolymer in an amount sufficient to increase viscosity of said fluid as a gel to a certain initial amount, a carbonate ion in an amount sufficient to actuate rapid formation of said gel upon addition of said chromium salt to said copolymer, an oxalate ion of a water soluble oxalate salt in an amount sufficient to stabilize said gel against syneresis upon standing and heating, said gel being formulated without a breaker component,

(2) applying sufficient pressure to consolidate sand in incompetent formations or to control water in subterraneous formations,

(3) maintaining said pressure while injecting said aqueous liquid into said formations.

4,193,454

SUPER-ACTIVE CLAY CATALYST AND USE THEREOF

Theodore P. Goldstein, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 666,838, Mar. 15, 1976, Pat. No. 4,078,991. This application Dec. 27, 1977, Ser. No. 864,573

Int. Cl.[2] C10G *13/04, 23/02*; E21B *43/22, 43/24*

U.S. Cl. 166—302 **22 Claims**

1. In a method for treating a clay material which comprises contacting said clay mateial located under the surface of the earth with solution containing cations selected from the group consisting of transition metal ions, hydrogen ions, aluminum ions, ions of metals from Group IIB of the Periodic Table of Elements and a combination thereof with each other to effect ion exchange of said clay material with said ions, the improvement comprising using a clay material in the raw state as found in nature or as synthesized which has not been exposed to a temperature exceeding about 100° C. prior to and during said contact with said solution and therafter exposing said exchanged clay material to a temperature of at least about 50° C. but not exceeding about 250° C.

19. An ion-exchanged clay material formed of a clay material in the raw state as found in nature or as synthesized, said clay material having been treated while located under the surface of the earth by contacting with a solution containing cations selected from the group consisting of transition metal ions, hydrogen ions, aluminum ions, ions of metals from Group IIB of the Periodic Table of Elements and mixtures thereof to effect an ion exchange of said clay material, said clay material having been exposed to a temperature not exceeding 100° C. prior to or during said treatment with said solution, said clay

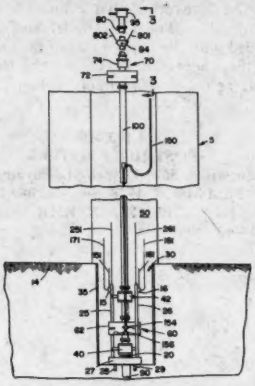
material after treatment with said solution having been exposed to a temperature within the range of about 50° C. to 250° C.

4,193,455

SPLIT STACK BLOWOUT PREVENTION SYSTEM

Riddle E. Steddum; Donald R. Ray, and Bruce L. Crager, all of Houston, Tex., assignors to Chevron Research Company, San Francisco, Calif.

Filed Apr. 14, 1978, Ser. No. 896,264
Int. Cl.[2] E21B 7/12
U.S. Cl. 166—359 **3 Claims**



1. A blowout prevention system for a movable offshore structure positioned on a subsea bottom above a well site in a body of water which may contain moving ice masses that could force the structure off location, comprising:

a subsurface blowout preventer stack at the subsea bottom having double shear rams for sealing a well;

a first means at the subsea bottom for disconnectably connecting a riser to said subsurface blowout preventer stack;

a subsea wellhead;

a second means at the subsea bottom for connecting said subsurface blowout preventer stack to said subsea wellhead, said subsurface blowout preventer stack, said first and said second means and said wellhead located in a chamber in the subsea bottom having a depth substantially greater than the combined height of said subsurface blowout preventer stack and said first and said second means so that said subsurface blowout preventer stack and said first and said second means are protected from damage due to ice masses contacting the subsea bottom in the vicinity of the well site;

a riser extending from the structure down to the subsea bottom and into said chamber and disconnectably connected at its lower end by said first means to said subsurface blowout preventer stack so that said riser may be connected into and disconnected from said subsurface blowout preventer stack;

a surface blowout preventer stack connected to said riser for providing means for controlling the well, said surface blowout preventer stack including a spherical blowout preventer connected at its lower end to the upper end of a double pipe ram blowout preventer;

a telescopic joint connected to said riser to permit vertical movement of said riser;

retrieval means connected to said telescopic joint for raising said riser out of said chamber and into the structure;

control means in the structure for selectively operating the shear rams of said subsurface blowout preventer stack to seal the well and said first means to connect and disconnect said riser;

kill and choke lines extending from the structure to said subsurface blowout preventer stack;

at least one choke valve positioned below said shear rams of said subsurface blowout preventer stack so as to be in communication with the well even after said shear rams have closed, said choke valve connected to said choke line; and

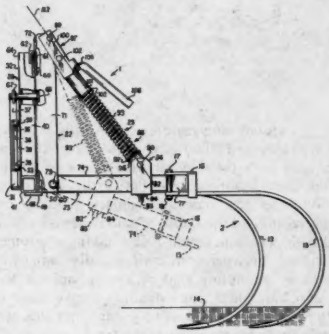
at least one kill valve positioned below said shear rams of said subsurface blowout preventer stack so as to be in communication with the well even after said shear rams have closed, said kill valve connected to said kill line.

4,193,456

BIASED AGRICULTURAL IMPLEMENT

Dale E. Ankenman, Rte. 1, Almena, Kans. 67622

Filed Apr. 17, 1978, Ser. No. 897,030
Int. Cl.[2] A01B 37/00, 35/24
U.S. Cl. 172—272 **8 Claims**



1. An implement for mounting a soil engaging tool on mobile agriculture equipment comprising:

(a) an upper and a lower pivoting means adapted for connection to said agricultural equipment;

(b) a trailing arm pivotally attached to said lower pivoting means and having a free end, said soil engaging tool being attached to said free end;

(c) a sloping extensile arm having an upper portion attached to said upper pivoting means and a lower portion;

(d) a sleeve member slidable along said trailing arm and pivotally attached to said extensile arm lower portion;

(e) fastening means adjustably securing said sleeve member in a desired position along said trailing arm, whereby said soil engaging tool is adjustable to a selected depth in the soil;

(f) stop means restricting the maximum length of said extensile arm;

(g) biasing means engaging and biasing said extensile arm upper and lower portions apart whereby said trailing arm and said soil engaging tool attached thereto are biased in a generally downward direction until said stop means is engaged;

(h) said extensile arm upper portion including an upper section and a lower section pivotally connected therebetween;

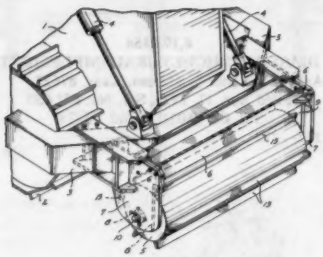
(i) first locking means whereby said upper and lower sections can be locked in an elongate position thereby lowering said soil engaging tool and engaging same with said soil by lengthening said extensile arm upper portion; and

(j) second locking means whereby said upper and lower sections can be locked in side by side position thereby raising and disengaging said soil engaging tool from said soil by shortening said extensile arm upper portion; and wherein:

(k) said first and second locking means in combination with

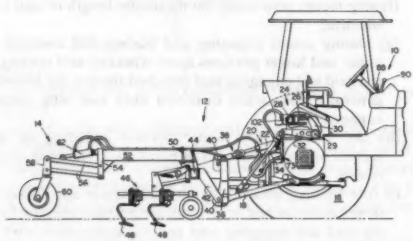
said hinged upper and lower sections comprise an over center locking mechanism.

4,193,457
CUTOVER LAND RESTORER
James H. Sphar, Silver Lake, Oreg.
Filed Jan. 12, 1978, Ser. No. 868,972
Int. Cl.[2] A01B *29/04*
U.S. Cl. 172—276 **2 Claims**



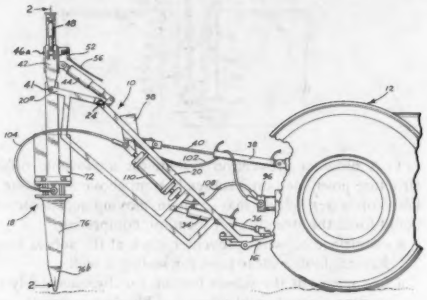
1. A cutover land restorer comprising a crawler tractor, an axially elongated roller having elongated slash-breaking cleats arranged with their lengths extending longitudinally of said roller, each cleat projecting outwardly from the circumference of said roller a distance approximately equal to one-third of the roller radius and the radius of said roller is between nine inches and eighteen inches, said roller having a circumferential wall extending between circumferentially adjacent cleats, and means for mounting said roller on said tractor for rotation about a horizontal axis extending transversely of said tractor with said cleats consecutively engaging the ground approximately on the same level as the tracks of said crawler tractor, and said mounting means being operable to press said roller against the ground, the circumferential spacing between adjacent cleats being a plurality of times as great as the radial width of said cleats for rolling said circumferential wall of said roller between said cleats on the ground.

4,193,458
TRACTOR AND IMPLEMENT AND HYDRAULIC SYSTEM THEREFOR
Harry M. Meinert, Des Moines, and John D. Long, Ankeny, both of Iowa, assignors to Deere & Company, Moline, Ill.
Filed Jun. 5, 1978, Ser. No. 912,555
Int. Cl.[2] A01B *63/22*
U.S. Cl. 172—328 **8 Claims**



1. In an improved tractor and implement arrangement comprising: a tractor having a three-point hitch including a pair of pivotally-mounted trailing lower draft links and a pivotally-mounted upper link, means operatively connected to and for raising and lowering the lower draft links including a single-acting rockshaft hydraulic cylinder, a hydraulic fluid reservoir, a source of hydraulic fluid pressure connected with the reservoir, and a control valve coupled with the source and reservoir and having two outlets, said valve operative to direct the flow of hydraulic fluid through either outlet either from the source or to the reservoir; an implement including a toolbar carried by the three-point hitch, a trailing lift assist wheel, a lift assist frame rotatably supporting the wheel for vertical movement relative to the toolbar, and a double-acting lift assist hydraulic cylinder between the implement and wheel for vertically moving the wheel; a single-acting hydraulic cylinder operatively coupled with the upper link of the tractor; first fluid line means coupled with one outlet of the control valve and connecting the hydraulic link cylinder and one end of the lift assist hydraulic cylinder in parallel; and second fluid line means coupled with the other outlet of the control valve and connecting the other end of the lift assist hydraulic cylinder in parallel with the rockshaft hydraulic cylinder.

4,193,459
POST-HOLE DRIVER
William J. Engstrom, 5608 E. 96th St., Puyallup, Wash. 98371
Filed Mar. 7, 1978, Ser. No. 884,138
Int. Cl.[2] E21C *11/02*; E21B *11/02*
U.S. Cl. 173—43 **5 Claims**



1. A post hole driver comprising:
(a) an elongated frame,
(b) frame mounting means comprising a draw bar arranged for attachment to a vehicle for pivotal movement about a horizontal axis relative to the vehicle, a cross bar connected to said one end of the frame and mounted on the draw bar for pivotal movement about an axis perpendicular to said horizontal axis, first extensible power means arranged to be connected at one end to the vehicle and at the opposite end to the frame for pivoting the latter about said horizontal axis, and second power means operatively interengaging the frame and draw bar for pivoting the frame about said perpendicular axis,
(c) universal pivot means comprising a yoke member connected pivotally to the said opposite end of the frame on a pivot axis extending transversely of the frame, and a bearing member connected pivotally to the yoke member on a pivot axis extending transversely of the frame and perpendicular to the first named pivot axis,
(d) an elongated shaft supported by the bearing member,
(e) a reciprocating drive hammer,
(f) a reciprocating drive hammer guide extending downward from the shaft guiding the hammer,
(g) an elongated hollow bit extending downward from the drive hammer and dimensioned to penetrate the ground to the desired depth of a post hole,
(h) an extensible fluid pressure piston-cylinder unit in the hollow bit engaging the drive hammer for alternately lifting and dropping the latter,
(i) the assembly of shaft, hammer, hammer guide and bit being suspended by the bearing member and yoke by

gravity, whereby to position the bit for forming a vertical post hole in the ground irrespective of the angular disposition of the vehicle,

(j) a first shock absorber interconnecting the frame and yoke for resisting movement of the yoke relative to the frame,

(k) a second shock absorber interconnecting the bearing member and yoke for resisting movement of the bearing member relative to the yoke, and

(l) latch means releasably interengaging the bearing member and the shaft and operable upon release to allow the bit to move downward by gravity for engagement of its lower end with the ground.

4,193,460

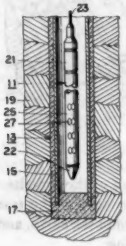
PERFORATING GUN WITH PAIRED SHAPED CHARGER VERTICALLY SPACED

Bruce Gilbert, 2508 Durham, Brownwood, Tex. 76801

Filed Jul. 17, 1978, Ser. No. 925,369

Int. Cl.[2] E21B *43/117*

U.S. Cl. 175—4.6 **6 Claims**



1. An improved perforating gun for perforating earth formations through a well casing wall with explosive jet charges, comprising:

a straight metal tube;

a rectangular bar extending substantially the length of the tube and secured inside the tube; and a plurality of bracket means for securing the charges to the bar in horizontal pairs that are vertically spaced apart each charge in each pair being in substantial contact with the other charge in the pair, the bracket means orienting all of the charges in the same direction and locating each charge within a pair so that its axis lies in a common plane with the other charge in the same pair, the common plane being perpendicular to the longitudinal axis of the tube;

the tube being of the type that will withstand disintegration when the charges are initiated allowing it to be retrieved to the surface;

the gun being adapted to be coupled to a decentralizer means for placing the gun in contact with a portion of the well casing wall, and including alignment means coupled to the bar for assuring that the charges all face the portion of the wall that the gun is contacting.

4,193,461

MEANS AND METHOD FOR FORMING AND ENLARGING HOLES IN SOIL

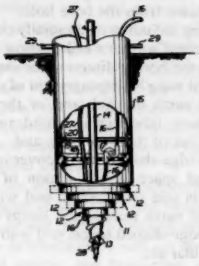
Bruce A. Lamberton, Berea, and Eduardo W. Bindhoff, Fairview Park, both of Ohio, assignors to Intrusion-Prepakt, Inc., Cleveland, Ohio

Filed Feb. 13, 1978, Ser. No. 877,091

Int. Cl.[2] E21B *11/02*

U.S. Cl. 175—19 **8 Claims**

1. A tool for forming or enlarging a hole in soil or similar earthen materials comprising a shaft having a bottom end adapted to be lowered into a hole as it is formed, a first ram assembly having a circular periphery of larger diameter than the cross-section of said shaft, concentrically mounted on said shaft near the bottom end thereof, said first ram assembly comprising at least one ram shoe moveable from a retracted position where the ram shoe forms a sector of the circular periphery of said first ram assembly, to an extended position where at least a portion of the ram shoe is disposed at a point which is a finite radial distance beyond the circular periphery of said first ram assembly, the generatrix of such points defining a first periphery of soil compaction, and means for moving said ram shoe between said retracted and extended positions, a second ram assembly mounted on said shaft above said first



ram assembly having a circular periphery which is equal to or slightly less than said first periphery of soil compaction, said second ram assembly comprising at least one ram shoe moveable from a retracted position where the ram shoe forms a sector of the circular periphery of said second ram assembly, to an extended position where at least a portion of the ram shoe is disposed at a point which is a finite radial distance beyond the circular periphery of said second ram assembly, the generatrix of such points defining a second periphery of soil compaction.

4,193,462

ROTARY BORING HEAD

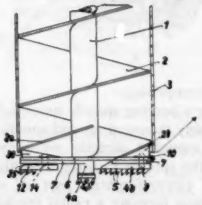
Kurt Blaschke, Saarbrücken-Dudweiler, and Josef Roob, St. Wendel, both of Fed. Rep. of Germany, assignors to Stahl- und Apparatebau Hans Leffer GmbH, Saarbrucken-Dudweiler, Fed. Rep. of Germany

Filed Mar. 2, 1978, Ser. No. 882,879

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1977, 2709030

Int. Cl.[2] E02D *17/14*

U.S. Cl. 175—292 **3 Claims**



1. A rotary boring head for boring holes in earth and rock formations and for use in connection with one or more bore tubes each having an end face, the rotary boring head comprising:

a helical screw;

a base plate at one end of said helical screw and disposed therebelow;

said helical screw and said base plate together partially defining a generally wedge-shaped space therebetween;

a rotatable chisel support coupled with said base plate;

a plurality of chisels on said support;

a pivotal wing mounted on said chisel support by a pivot shaft disposed parallel to the axis of rotation of said chisel support;

a plurality of chisels on said pivotal wing, said chisels on said wing being capable of cutting freely when said pivotal wing is swung into a radially outward working position in relation to said chisel support;

an abutment for limiting movement of said pivotal wing;

said pivotal wing being swingable into an inner rest position upon reversal of the direction of rotation of the boring head, which reversal takes place when the boring head is to be withdrawn from the bore hole;

said pivotal wing including on a radially outwardly disposed side wall thereof a return rail portion which is inclined upwardly in the boring direction for assisting swing back of said pivotal wing by impingement of said return portion on loosened earth or rock and/or the end face of the lowermost bore tube during withdrawal of the rotary boring head out of the bore hole; and

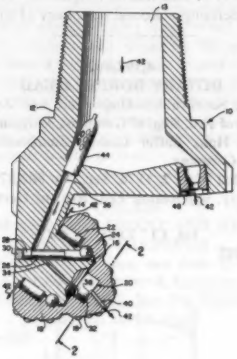
a generally wedge-shaped wall covering said generally wedge-shaped space in the region of said pivot shaft which mounts said pivot wing, said wall sealing against the ingress of earth masses and lumps of rock into said generally wedge-shaped space, said wall extending axially and in a circular arc.

4,193,463

DRILLING BIT FLUID-COOLED FRICTION BEARING

Robert F. Evans, La Habra, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Apr. 27, 1977, Ser. No. 791,626
Int. Cl.[2] E21B *9/10*
U.S. Cl. 175—337 **10 Claims**



1. A drill bit comprising:

a body having a bearing spindle mounted thereon;

a cutter rotatably mounted on said spindle with a portion of the cutter mounted directly on a cylindrically-shaped portion of the spindle forming a friction bearing for the cutter, the circumferential part of said cylindrically-shaped portion forming a radial friction bearing surface for said cutter, and the end face of said cylindrically-shaped portion forming a thrust bearing for said cutter, said friction bearing having a loaded zone and a non-loaded zone when said friction bearing is subjected to a load, said loaded zone being in surface to surface contact with said cutter;

fluid ducting means in said spindle for transmitting fluid to cool the spindle and the cutter and including a passage in said cylindrically-shaped portion forming the loaded zone of the friction bearing, said passage extending across said radial friction bearing surface and onto said end face and terminating near the center of said end face; and

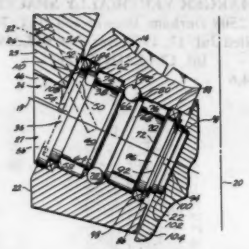
means defining a hole through said cutter in communication with said passage at the center of said end face and with said fluid ducting means through said passage and extending to the cutter exterior so that a substantial and continuous coolant flow through the spindle and cutter can be maintained.

4,193,464

REPLACEABLE SHIRTTAIL

Robert L. Dixon, Brea, Calif., assignor to Smith International, Inc., Irvine, Calif.

Filed May 8, 1978, Ser. No. 903,811
Int. Cl.[2] E21B *9/08*
U.S. Cl. 175—364 **18 Claims**



1. In an earth boring tool of the type having a rotary cutter, a shirttail having a base to protect the rotary cutter from the wall of a bore being formed in the earth, and an axis of rotation, an improvement comprising:

a journal forming a rotational axis of the cutter;

means for mounting the cutter on the journal for rotation about the rotational axis of the cutter, such means including bearing means between the cutter and the journal;

means for removably mounting the journal and cutter to the balance of the tool such that the cutter rotates at an acute angle to the wall of the bore with only a portion of the cutter intersecting the wall and with the balance of the cutter being radially inward of the wall, such mounting means including a yoke, the yoke having radially spaced-apart legs, the leg of the larger radius having an end surface with a radial component and an acircular in cross section notch in the end surface, the journal having an acircular in cross section lug received by the notch, whereby the journal cannot rotate with respect to the leg;

means for preventing the journal from rotating with respect to the yoke;

seal means between the bearing means and the yoke leg of larger radius; and

means for removably mounting the shirttail to the balance of the tool to protect the cutter from the wall of the bore, the base of the shirttail shielding the cutting means.

4,193,465

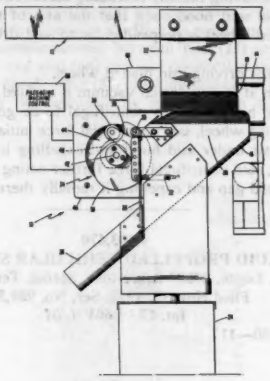
SCALE HOPPER DOOR MECHANISM

Nelson R. Henry, Decatur, Ga., assignor to The Woodman Company, Inc., Decatur, Ga.

Filed Jan. 27, 1978, Ser. No. 872,945
Int. Cl.[2] G01G *13/16*; B67D *3/00*
U.S. Cl. 177—108 **7 Claims**

1. A scale hopper door mechanism for controlling flow of loose product from a scale hopper in a packaging machine, said mechanism comprising a pivoted door, means biasing said door towards its closed position, a cam follower carried by said door, and a rotary cam acting in combination with said cam follower to force said door open against the influence of said

biasing means, said rotary cam being mounted independently of the scale hopper, and said rotary cam having a profile such



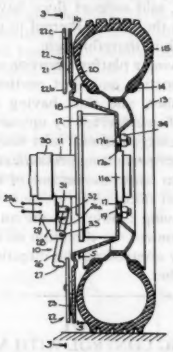
that said cam follower is not in contact with said rotary cam while product is being weighed in the scale hopper.

4,193,466

TRACTION-ENHANCING DEVICE FOR AUTOMOTIVE VEHICLE DRIVE WHEELS

Fernando Arberman, 64-11 99th St., Rego Park, N.Y. 11374

Filed Feb. 8, 1979, Ser. No. 10,308
Int. Cl.[2] B60B *15/00*
U.S. Cl. 180—15 **8 Claims**



1. A traction-enhancing device for an automotive vehicle having a drive wheel axle and a tired drive wheel mounted thereon, said device comprising:

an annular disc having an outer diameter less than that of the tread of the tire when the same is properly fully inflated, and means for mounting said annular disc on said drive wheel axle inboard of said drive wheel and for joint rotation with said drive wheel, said annular disc being provided, between and concentric with its inner and outer peripheral edges, with an annular groove formed on that face of said annular disc to be directed inboard of the vehicle when said annular disc is mounted on said drive wheel axle;

at least one traction element rockably mounted on said annular disc at said face of the latter for angular movement relative to said annular disc and between a rest position and a working position, said traction element having a foot portion projecting toward said outer peripheral edge of said annular disc and a cam portion projecting toward said inner peripheral edge of said annular disc, said foot portion being dimensioned to extend beyond the ground-engaging tread surface of a fully inflated tire associated with said annular disc when said traction element is moved to said working position, and said cam portion being dimensioned to overlie said annular groove when said traction element is in said rest position;

resilient means interconnected between said annular disc and said traction element for biasing the latter toward said rest position thereof;

an abutment member having a tip end region dimensioned to fit smoothly slidably into said groove, and means for supporting said abutment member for reciprocal movement of said tip end region thereof between protracted and retracted positions relative to said annular disc, said supporting means being adapted, when mounted on the vehicle, to dispose said tip end region of said abutment member in position to enter and be received in the nadir of said groove upon said tip end region being moved to said protracted position thereof; and

operating means for effecting said reciprocal movement of said tip end region of said abutment member;

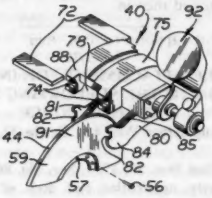
said cam portion of said traction element and said abutment member, upon protraction of said tip end region of the latter into said groove and concurrent rotation of said annular disc with a vehicle drive wheel when the tread of the tire on the latter is located on a slippery surface on the ground, coating whenever said cam portion comes into engagement with said tip end region, to move said traction element out of said rest position and to shift said foot portion thereof so as to project beyond the tire tread and engage the ground for providing a temporary increase in traction and a small degree of vehicle momentum to enable the vehicle to escape from said slippery surface.

4,193,467

PARKING BRAKE MOUNTING

Gerald P. Simmons, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 13, 1977, Ser. No. 859,360
Int. Cl.[2] B60T *1/06;* **F16D** *65/12*
U.S. Cl. 180—271 **7 Claims**

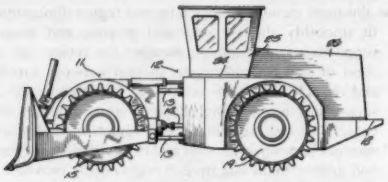


1. In a braking system for a vehicle having a frame with a pair of spaced apart side walls, an engine carried by the frame, a drive line running from the engine to a differential, a pair of wheels carried on an axle extending from said differential and being driven by said drive line, in combination, a brake assembly acting on said drive line to stop rotation of said drive line and said wheels, a crossbeam extending between the side walls of said frame, a brake disc encircling said drive line and being rigidly attached to said drive line, said brake assembly being mounted on said crossbeam and having a caliper straddling one portion of said brake disc, said caliper being slidably mounted on said crossbeam for movement parallel to said drive line, said caliper having spaced apart brake shoes with one shoe aligned with one portion of one face and the other shoe aligned with the opposite portion of the other face of said brake disc, actuator means on said brake assembly for urging said brake shoes into contact with said brake disc and for releasing said brake shoes from said contact with said brake disc.

4,193,468
COMBINATION VEHICLE UNDERPAN AND MAINTENANCE PLATFORM

Charles F. Riddle, Brookfield, Wis., and Paul E. Ritchey, Madison, Ind., assignors to Rexnord Inc., Milwaukee, Wis.

Filed Aug. 23, 1978, Ser. No. 936,165
Int. Cl.[2] B62D *25/20*
U.S. Cl. 180—89.17 6 Claims

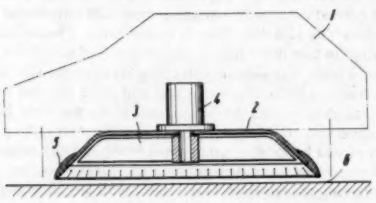


1. A relatively large, self-propelled machine including a frame having lower plates which define an opening for access to and entry into the interior of the frame from the underside thereof for servicing the operating components of the machine positioned in said interior, an underpan which is selectively movable vertically to upper and lower positions respecting the frame, in the upper position the underpan being disposed to close said opening and being essentially flush with said plates for sliding over projecting objects over which the machine passes, and actuating means positioned within the interior of said frame and supported thereby and connected to said underpan for raising and locking the underpan in the described upper position and for lowering the underpan to a lower position where it may lie on the ground beneath the machine and where being spaced below the frame it provides entry to the interior of the frame through said opening, said underpan having upper edges which are smoothly rounded so as to present no sharp edges to the mechanic in making such entry and a top side which is smooth and may be readily wiped clear of oil and debris by the mechanic in making such entry, the top side of said underpan being flat and when spaced below the frame such that it serves as a platform on which a mechanic may lie or stand while servicing the operating components of the machine positioned therein.

4,193,469
VEHICLE ATTACHMENT FOR INCREASING ADHESION TO THE SUPPORTING SURFACE BY SUCTION FORCE

Dieter Graf, Lupsteiner Weg 4, 1 Berlin 37, Fed. Rep. of Germany

Filed Dec. 27, 1977, Ser. No. 864,547
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1977, 2700395
Int. Cl.[2] B60B *39/00*
U.S. Cl. 180—164 7 Claims



1. An apparatus for generating traction of a vehicle to a driveway surface by generating a suction force between said vehicle and said driveway surface, said apparatus including:

a hood having an opened bottom and means for firmly mounting said hood to said vehicle to define a gap between the rim of said hood and said driveway surface;

a wheel having radially extending blades rotatably mounted within said hood such that the axis of rotation of said bladed wheel is perpendicular to said driveway surface, and

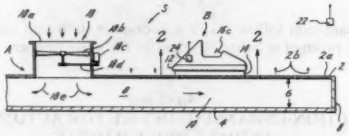
means for driving said bladed wheel,

wherein at least a partial vacuum is created only under the entire hood through centrifugal force generated by the rotating wheel, said centrifugal force initially acting upon said air under said hood and expelling it radially therefrom, said centrifugal force further acting upon air entering said gap and expelling it radially therefrom.

4,193,470
FLUID PROPELLED VEHICULAR SYSTEM

Russell J. Logan, 29007 Atherstone, Spring, Tex. 77373

Filed Nov. 13, 1978, Ser. No. 959,511
Int. Cl.[2] B60V *1/04*
U.S. Cl. 180—117 19 Claims



1. A fluid propelled vehicular system comprising:

a pressurized fluid delivery assembly having a support floor elevated from a support base and a perimeter barrier forming an enclosure for pressurized fluid received from a suitable source, said support floor having a plurality of openings across the surface thereof to permit the passage of pressurized fluid therethrough;

a vehicle body having a platform portion and a skirt portion, said platform portion and skirt portion forming a fluid receiving chamber, said skirt having a surface area to respond to the force exerted by upwardly directed pressurized fluid thereagainst, said skirt having an outlet adjacent said chamber permitting pressurized fluid to exit from said chamber, to cause movement of said vehicle body over said support floor; and

a rudder means having a movable vane rotatably mounted in said outlet to control the direction of movement of said vehicle body by controlling the direction of exit of fluid from said chamber.

4,193,471
POWER STEERING CONTROL WITH MAINTENANCE OF HYDRAULIC BLOCKING OF POWER CYLINDER

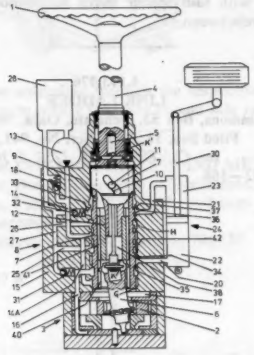
Armin Lang, Schwabisch-Gmund, Fed. Rep. of Germany, assignor to Patentburo Zahnradfabrik Friedrichshafen AG., Friedrichshafen, Fed. Rep. of Germany

Filed Jan. 5, 1978, Ser. No. 867,300
Int. Cl.[2] B62D *5/08*
U.S. Cl. 180—154 5 Claims

1. In a booster steering system of the kind described comprising a flow control valve means having a valve sleeve (7) and housing (15) each having grooves effecting coacting lands and being relatively movable responsive to operator control from a neutral position to selectively open and close gaps for controlling flow of pressure and exhaust fluid with respect to the pressure chambers (22, 23) of a double acting power steering cylinder (24) having a piston between said pressure chambers, and comprising in said system a tank (28) source of fluid and said system having connection means for fluid flow responsive to relative position of said valve sleeve and housing; and means (5, 10, 11, etc.) for providing return movement between said valve sleeve and said housing to said neutral position following

operator controlled movement thereof from said neutral position;

the improvement wherein said valve sleeve and housing have a pair of overlappable coacting lands (37) disengaged in said neutral position to effect an open gap operative to permit communication between one (23) said pressure chamber and said tank via said connection means with a one way check valve (32) blocking said communication to said tank but openable by suction from said pressure



chamber to permit flow from said tank to said pressure chamber to maintain said one pressure chamber fluid filled in the event of leakage therefrom, said valve sleeve and housing having a pair of coacting overlapping lands effecting a closed gap (35) in said valve sleeve neutral position to block flow through said connection means from the other pressure chamber (22) to said tank, whereby said pressure chambers are hydraulically blocked in any steering operated position or neutral position when said valve sleeve is in neutral position.

4,193,472

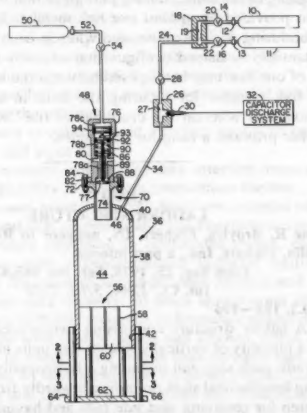
OPEN-ENDED SEISMIC SOURCE

Robert A. Kirby, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Jul. 21, 1978, Ser. No. 926,671

Int. Cl.[2] G01V *1/38, 1/10*

U.S. Cl. 181—118 **16 Claims**



1. An apparatus for generating pulses in a liquid medium, said apparatus comprising:

a barrel defining a chamber which holds gas and which has an outlet communicating between the chamber and the medium;

means for abruptly increasing the pressure of the gas in the chamber so that at least some of said gas escapes from the chamber through the outlet into the medium and creates a pulse in the medium; and

a reaction plate having a face and being connected to the barrel and disposed outside the barrel adjacent to and spaced from the outlet so that gas escaping through the outlet impinges upon the face of said reaction plate, said face having a surface area greater than the cross-sectional area of said outlet,

whereby the recoil of the barrel caused by the escaping gas is reduced.

4,193,473

REFRACTIVE STIGMATIC SYSTEM FOR ELASTIC SURFACE WAVES

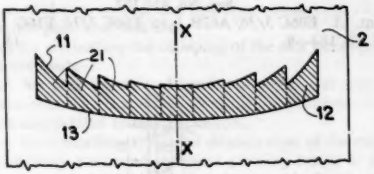
Pierre Hartemann, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 520,203, Nov. 1, 1974, abandoned. This application Jul. 7, 1977, Ser. No. 813,650

Claims priority, application France, Nov. 2, 1973, 73 39082

Int. Cl.[2] G10K *11/00*

U.S. Cl. 181—176 **9 Claims**



1. A refractive stigmatic system for the directive transmission of elastic surface waves, said system comprising: a substrate having a surface for propagating said elastic surface waves, and at least one refractive zone located in said surface; the velocity of propagation of said elastic surface waves in the extent of said refractive zone differing by a predetermined amount from that encountered in the neighboring regions of said surface; means for imparting a bending to the paths of travel followed by said elastic surface waves including a string of elementary tapered zones formed in said refractive zone; the mean paths of travel located midway between the limits of each said elementary zones being substantially equal from one of said elementary zones to the next for equalizing the attenuation undergone by said elastic surface waves upon being refracted by said refractive zone, the respective widths of said elementary zones measured along said string being greater than a multiple of the wavelength of said elastic surface waves upon which said bending is imparted.

4,193,474

SOUND INSULATING UNIT AND SOUND BARRIER

Katsuyuki Okubo, Osaka; Nobuyasu Ueda, Hyogo, and Tetsumi Ono, Chiba, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 11, 1978, Ser. No. 895,391

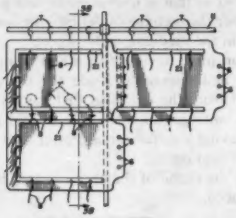
Int. Cl.[2] E04B *1/343, 1/82;* **C04B** *43/00*

U.S. Cl. 181—287 **14 Claims**

1. A sound insulating unit comprising:

a flexible sheet of a polymeric material and a high density inorganic material, said inorganic material being in the form of a powder or fiber, said sheet having a surface density of at least 2.0 Kg/m^2, and means for connecting and detaching said unit to at least another of said unit, said

connecting and detaching means affixed to said unit, wherein said connecting and detaching means being



adapted for overlapping of the edges of said units being connected to each other and preventing sound leakage from the overlapping portion.

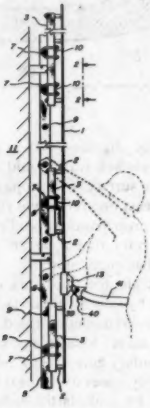
4,193,475
RIGID RAIL SAFETY DEVICE

Robert P. Sweet, and Daniel L. Stember, both of Red Wing, Minn., assignors to D B Industries, Inc., Red Wing, Minn.

Continuation-in-part of Ser. No. 680,281, Apr. 26, 1976, Pat. No. 4,071,926, which is a continuation-in-part of Ser. No. 468,568, May 9, 1974, Pat. No. 3,979,797. This application Nov. 23, 1977, Ser. No. 854,152

Int. Cl.[2] **E06C** *5/36;* **A62B** *1/16;* **E06C** *7/18;* **F16G** *11/00*

U.S. Cl. 182—8 **13 Claims**



1. A safety rail system for mounting on a ladder, said system comprising:

an elongated rail having a substantially rectangular cross-section and being relatively thin whereby when said rail is installed with the elongation parallel to the longitudinal extent of the ladder, said rail may be easily bent about an axis parallel to the ladder rungs so as to follow ladder contours;

at least one mounting bracket for attachment to a plurality of said rungs;

means for attaching each said mounting bracket to a plurality of said rungs, said attaching means being infinitely adjustable along the length of said mounting bracket, and

means for securing said rail to said brackets, in spaced relationship outwardly from said ladder and said brackets, said securing means comprising:

a plurality of bolts, said bolts having tapered heads;

a corresponding plurality of tubular spacers each of said spacers having a bore sized to accommodate one of said bolts, each of said spacers being of such length and diameter so as to allow a safety clamp to substantially encircle said safety rail;

said safety rail having a plurality of spaced countersunk holes to accommodate said bolt heads flush with the surface of said rail, thereby presenting a plane surface for gripping engagement; and

said spacers being located between said mounting brackets and said rail, said bolt heads being located in said countersunk holes, said bolts fastening said rail to said brackets with said spacer bores accommodating said bolt therebetween.

4,193,476
LINK LADDER

Jerry D. Emmons, Box 53, Ochelata, Okla. 74051

Filed Sep. 11, 1978, Ser. No. 941,232

Int. Cl.[2] **E06C** *1/36, 1/52, 5/30*

U.S. Cl. 182—164 **5 Claims**

1. A collapsible ladder comprising a plurality of link members pivotally secured in end-to-end relation abutment, means provided on each link member for cooperating with the adjacent link member to preclude relative rotation therebetween in one direction, arcuate means provided on each link member for cooperating with the adjacent link member for facilitating relative rotation therebetween in an opposite direction for collapsing of the ladder during periods of non-use, engagement means provided on at least one link member for securing the ladder during periods of use, and wherein each link member is substantially A-shaped configuration whereby the head of the "A" of one link may be disposed between the legs of the adjacent link member for securing the links in said end-to-end relation, and wherein the cross bar of the "A" of each link member provides a rung for the ladder.

4,193,477
LADDER STRUCTURE

Wayne R. Broyles, Elkhart, IN, assignor to Ronald A. Minichillo, Elkhart, Ind., a part interest

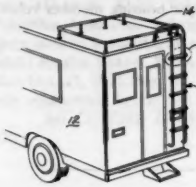
Filed Sep. 25, 1978, Ser. No. 945,434

Int. Cl.[2] **E06C** *5/02, 7/08*

U.S. Cl. 182—194 **7 Claims**

1. A ladder structure comprising two spaced, vertical side rails, a plurality of vertically spaced step units mounted on said side rails, each step unit including a horizontally disposed step having longitudinal slots extending inwardly from each end of said step for receiving said side rails and having downwardly extending side walls and inwardly extending flanges at the lower edge thereof forming laterally spaced grooves, separate end caps on the ends of said step for closing the ends of said

slots, each of said end caps having portions for seating in said grooves when said caps are secured to the ends of said step,



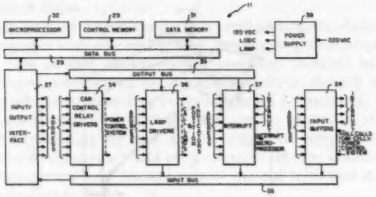
and screw means extending through the respective side rails and into said step to secure said step to said side rails.

4,193,478

ELEVATOR CONTROL SYSTEM AND METHOD

Vernon P. Keller; Don B. Alley, both of Sacramento, and Steven T. Majoewsky, Placerville, all of Calif., assignors to Elevator Industries, Sacramento, Calif.

Filed Apr. 26, 1977, Ser. No. 791,157
Int. Cl.[2] B66B 1/16
U.S. Cl. 187—29 R **22 Claims**



1. An electronic control system for controlling indicator and drive components for an elevator in a hoistway responsive only to control output signals of a relatively high predetermined voltage level resulting from elevator car command and status inputs at said high voltage level, said command and status inputs being responsive to and dependent on the command for the status of said elevator at any given time in its operation, comprising

input buffer means located in a remote vicinity of said hoistway and coupled to receive the command and status inputs for converting all of the latter to input data at a relatively low predetermined voltage level,

means for receiving output data all of which is at said low voltage level and converting the latter to said high voltage level control output signals in response thereto,

interface means for receiving and transmitting said input and output data therethrough,

a data memory coupled to said interface means to receive and store said input data,

a program memory coupled to said interface means and having a plurality of program instructions therein,

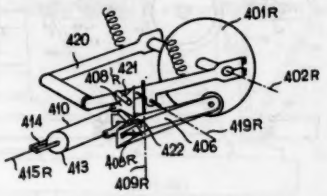
a data processor providing serial functions coupled to said program and data memories and said interface means, said data processor operating in continuous cycles, each in accordance with a predetermined program routine to determine the status of said input data, to store said input data in said data memory, to fetch stored input data in accordance with said program, to formulate output data in accordance with said program and fetched stored input data, and to transfer said output data through said interface means to said means for receiving output data for providing said control output signals and controlling said indicator and drive components, whereby each system input is read during each program routine cycle, and each system output is set or reset as appropriate during the same cycle.

4,193,479

BRAKING ARRANGEMENT AND BRAKE, PARTICULARLY FOR TWO-WHEELED VEHICLES

Jean-François Quilici, Saint Cloud, France, assignor to Renault Moteurs Developpement, Boulogne-Billancourt, France

Filed Dec. 14, 1977, Ser. No. 860,482
Claims priority, application France, Dec. 14, 1976, 76 37582
Int. Cl.[2] B60T 1/06
U.S. Cl. 188—2 A **4 Claims**



1. A disk brake for vehicles equipped with a system of coordinated braking of the front and rear wheels which comprises:

a disk brake associated with a wheel of the vehicle and extending from a hub part of said wheel;

a caliper holder including only a first and second friction pad mounted thereon and disposed one on each side of the disk so as to always contact said disk upon engagement of said friction pads with said disk;

means for controlling the clamping of the disk between the friction pads;

means for pivoting the caliper holding the pads onto an element of the vehicle frame, outside the periphery of the disk and parallel to the axis thereof;

means for controlling the radial displacement of the caliper operatively associated with said pivoting means so as to obtain a variation in the distance between the friction pads and the axis of the disk as a linear function of the clamping force including

a cam for controlling the radial displacement of the caliper interposed between the caliper and a frame carrying the caliper; and

a first and second stop attached to the vehicle frame and the lining holder caliper such that the cam controlling the radial displacement of the caliper is interposed between said first and second stop.

4,193,480

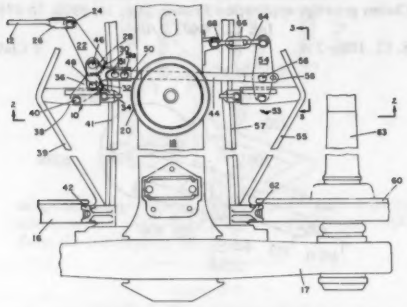
RAILWAY CAR BRAKE RIGGING

Lowell L. Malo, St. Peters, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Jun. 28, 1978, Ser. No. 920,311
Int. Cl.[2] B61H 13/04
U.S. Cl. 188—52 **9 Claims**

1. A brake rigging for a railway car comprising: a top rod extending over an inner truck axle; said inner axle attached at opposite ends thereof to inner wheels; said top rod connected to a gear means located between said inner axle and a truck bolster; said gear means including a first gear lever having a curved segment end portion with gear teeth thereon which engage gear teeth on a curved segment portion of a second gear lever; said first and second gear levers lying in a common plane which is obliquely oriented relative to said inner axle; said second gear lever connected to an inner brake beam having shoes thereon and said inner brake beam extending between said inner wheels; inner connecting means attached to at least one of said first and second gear levers and connected to a first end of a longitudinally extending bottom connection which extends through said truck bolster; said bottom connection having an opposite end with outer connecting means for attaching said bottom connection to an outer brake means having shoes thereon for applying the brakes to a pair of outer

wheels; whereby when said top rod is moved longitudinally of the car, said first and second gear levers are moved toward said inner axle, which moves said inner brake beam shoes into engagement with said inner wheels and prevented further inward movement of said second gear lever; and whereby



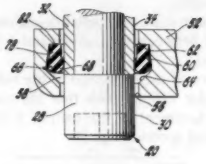
further inward movement of the top rod results in relative rotation between said first and second gear levers and movement of said bottom connection outwardly through the bolster to move said outer brake beam outwardly to apply the outer brake shoes to said outer wheels.

4,193,481

DRAG FREE SLIDING CALIPER DISC BRAKE BUSHING

Langley H. Wunderlich, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 25, 1978, Ser. No. 927,855
Int. Cl.[2] F16D *65/54*
U.S. Cl. 188—71.8 **4 Claims**



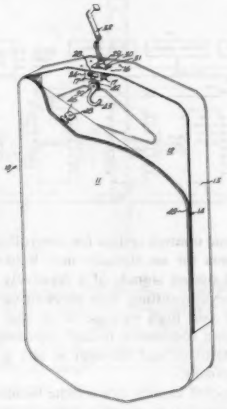
1. In a drag-free sliding caliper disc brake having
a cylindrical support member;
a caliper housing member having a cylindrical opening therethrough through which said support member extends;
one of said members having a groove formed therein defined by a bottom wall and side walls and opening toward the other of said members within said cylindrical opening; the improvement comprising:
an annular resilient rubber-like bushing received in said groove, said bushing having a toroidal main body engaging said groove bottom wall and the cylindrical surface of said other member in a grip-slip relation, said bushing having a series of circumferentially spaced resilient protrusions extending from said main body in an axial direction and normally engaging one of said groove side walls and radially spaced from said other member so as to have no radial loading thereon;
said bushing protrusions being axially compressed upon brake actuation by sliding movement of said caliper housing member relative to said support member in the brake actuating direction, said bushing protrusions upon brake release expanding axially and moving said caliper housing member relative to said support member in the brake releasing direction until there is no brake drag, said bushing main body slipping relative to said other member during brake actuation only when the sliding movement is sufficient to require adjustment of the brake release position of said caliper housing member relative to said support member.

4,193,482

GARMENT BAG HANGER ASSEMBLY

William Koff, 2100 S. Ocean La., Fort Lauderdale, Fla. 33316

Filed Apr. 30, 1979, Ser. No. 34,406
Int. Cl.[2] A45C *13/00*
U.S. Cl. 190—41 B **10 Claims**



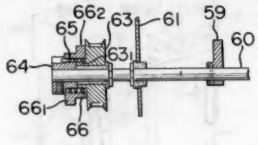
1. A garment bag hanger assembly comprising, in combination, a garment bag having elongated, flexible front and back panel members, a peripheral gusset interconnecting said front and back panel members and defining therewith an interior garment enclosing chamber, a hanger member for hangingly supporting garments, a hanger slide support member fixed with respect to the inside of a central top portion of said gusset, said hanger slide support member comprising a front-to-back, slotted base portion and an upstanding front wall portion having a through opening communicating with said base portion slot, said through opening comprising a relatively wide upper end portion, said hanger comprising at its upper end a slide member receivable through said front wall portion through opening and defining a first laterally extending portion seatable and slidable along the front-to-back slotted base portion of said hanger slide support member, means for separating an upper portion of said front panel member at its line of juncture with said peripheral gusset to permit access to said interior garment enclosing chamber, a keeper member secured to an inside central portion of said front panel member, said keeper member being receivable through said front wall portion through opening and defining a second laterally-extending portion seatable upon the front-to-back slotted base portion of said panel slide support member.

4,193,483

LATCH OPERATED COIL SPRING CLUTCH

Masao Ariga, Kawasaki; Hiroyuki Hattori, Inagi; Katsuichi Shimizu, Hoya; Hirotoshi Kishi, Tokyo; Hiroshi Ogawa, Kawasaki; Takahiko Amanuma, Tokyo; Kazumi Umezawa, and Seiji Sagara, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1977, Ser. No. 841,209
Claims priority, application Japan, Oct. 22, 1976, 51-127493
Int. Cl.[2] F16D *13/08*
U.S. Cl. 192—26 **2 Claims**



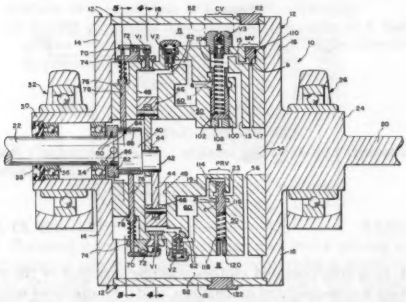
1. A spring clutch device comprising:
a driving side clutch shell;
a driven side clutch shell opposed to and coaxial with said driving side clutch shell;
a clutch spring disposed in a tight manner over said two clutch shells;
a stop member disposed coaxially with said clutch shells and engaged with one end of said clutch spring to control the action of said clutch spring, said stop member having projections formed on the circumference thereof in an axially and circumferentially staggered relationship; and
a control member selectively displaceable to axial positions corresponding to said axially staggered projections to selectively contact said projections to thereby control the engagement and disengagement thereof with said driven side clutch shell.

4,193,484

ROTARY HYDROSTATIC COUPLING

Samuel A. Collier, 1714 S. Olive, Pittsburg, Kans. 66762

Filed Apr. 6, 1978, Ser. No. 893,949
Int. Cl.[2] F16D *31/00, 43/284*
U.S. Cl. 192—60 **16 Claims**



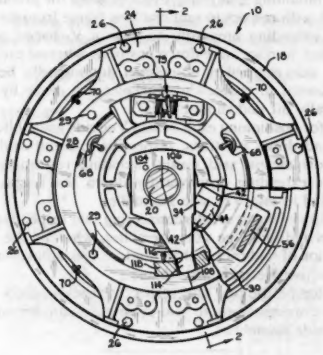
1. A hydrostatic coupling comprising a casing establishing an internal fluid reservoir including a peripherally disposed outer annular reservoir space and a centrally disposed inner reservoir space in communication with said outer space, a coaxial drive shaft carried by the casing, a driven shaft axially aligned with said drive shaft and projecting into said inner reservoir space in sealed relationship, radially disposed cylinders interiorly of the casing for rotation bodily therewith, means within the casing establishing a fixed volume manifold intermediate said outer and inner reservoir spaces and having plural channels leading therefrom to the reservoir, a crank head on said driven shaft, a piston for each cylinder reciprocable between inner and outer positions, an inflow check valve effective between each cylinder and the outer reservoir space for admitting centrifugally pressurized fluid to the cylinder for charging purposes to drive the piston to its inner position, an outflow check valve effective between each cylinder and the manifold, and valve means for controlling the flow of fluid through said channels and effective to variably bleed fluid from the manifold to the reservoir, and means responsive to rotation of the driven shaft relative to the drive shaft and engageable with the inflow valve for controlling the operation of the latter.

4,193,485

AIR PRESSURE LOADED CLUTCH

Marvin D. Johns; Gordon W. Denton, both of Fort Wayne, and Ronald E. Heymann, Auburn, all of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 29, 1977, Ser. No. 865,542
Int. Cl.[2] F16D *25/08*
U.S. Cl. 192—85 CA **4 Claims**



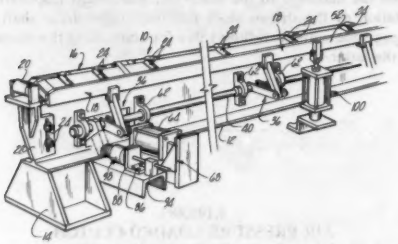
1. In a friction clutch adapted to drivingly connect rotatable drive and driven members, a cover secured to the drive member for rotation therewith, a pressure plate rotatably drivable by the cover and axially movable relative thereto, the pressure plate selectively engageable with the driven member, pivotable levers disposed between the cover and pressure plate for moving the pressure plate axially relative to the cover, and a collar rotatably drivable by the cover and axially movable relative thereto, the collar selectively engageable with the levers for effecting pivotal movement thereof; the improvement comprising a non-rotatable hydraulic unit including:
a housing supported by the cover,
a piston assembly supported by the collar,
a sliding connection interconnecting said housing and said piston assembly, said sliding connection including an axially extending tongue on said piston assembly slidably received in said groove,
an expansible diaphragm secured to said housing and engageable with said piston assembly,
a pressure chamber between said diaphragm and said housing,
porting in said housing for pressurizing said pressure chamber, and
means for biasing the collar toward the cover.

4,193,486

DOUBLE DUMP RUNOUT TABLE

Alexander Borzym, Dearborn, and John J. Borzym, Birmingham, both of Mich., assignors to Alpha Industries, Inc., Novi, Mich.

Filed Mar. 19, 1979, Ser. No. 21,539
Int. Cl.[2] B65G *13/00*
U.S. Cl. 193—35 R **15 Claims**



1. A runout table comprising:

a table frame;

a pair of elongated Vee side assemblies extending away from each other and along the length of said machine frame to form a supporting surface;

means mounting said respective Vee sides for pivotal movement with respect to said machine frame from an up position extending upwardly to form a V-shaped receiving surface, to respective down positions whereat each of said Vee side assemblies is inclined downwardly below the horizontal to enable the workpiece to move by gravity laterally off said runout table;

means for positioning each of said Vee side assemblies in said up and down positions, respectively, about said pivotal support means, said means including respective rocker shafts extending downwardly down the length of and parallel to said Vee side assemblies;

a plurality of linkages interconnecting said respective rocker shafts and said Vee side assemblies, whereby the rotative position of said rocker shaft controls the inclination of said respective Vee side assemblies;

means for positioning said respective rocker shafts in positions corresponding to said up and down position of said Vee side assemblies.

4,193,487

COMBINED NEW OIL VENDING AND WASTE OIL REMOVING APPARATUS

Shigeo Takeuchi, Nagoya, Japan, assignor to Takeuchi Tekko Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 29, 1978, Ser. No. 891,489
Claims priority, application Japan, Oct. 25, 1977, 52-127839
Int. Cl.[2] G07F *15/12*; F16N *33/00*
U.S. Cl. 194—9 T **10 Claims**

1. A combined new oil vending and waste oil removing apparatus comprising:

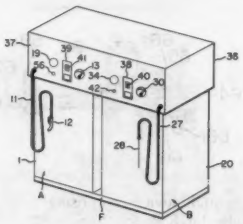
a waste oil removing device having a waste oil reservoir for storage of waste oil, a waste oil metering tank for metering the quantity of waste oil to be removed from an external oil reservoir, and a waste oil removing circuit for removing waste oil from said external oil reservoir into said waste oil reservoir;

a fresh oil feeding device having a fresh oil reservoir for storage of fresh oil, a fresh oil metering tank for metering the quantity of fresh oil to be fed therefrom to said external oil reservoir, and a fresh oil feeding circuit for feeding fresh oil from said fresh oil reservoir to said external oil reservoir;

a control device for controlling the operations of said waste oil removing device and said fresh oil feeding device, said control device including a first control means with a first coin slotter for controlling the operation of said fresh oil feeding device, and a second control means with a second coin slotter for controlling the operation of said waste oil removing device;

a feed pipe connected to said fresh oil reservoir for supplying fresh oil, and a two-way changeover valve included in said feed pipe for the opening and closing thereof;

a fresh oil level detector in said fresh oil reservoir, said detector including a rod portion vertically disposed in said fresh oil reservoir, a pair of first and second limit switches



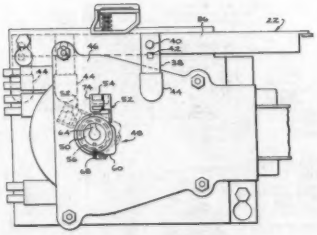
mounted on said rod portion, and a float member fitted over said rod portion for vertical sliding movement therealong, whereby when the oil level in said fresh oil reservoir rises above an upper limit, said first limit switch is actuated by said float member to change over said two-way valve for closure of said feed pipe, whereas when the oil level in said fresh oil reservoir falls below a lower limit, said second limit switch is acutated by said float member to produce an alarm signal for warning to the exterior of the shortage of fresh oil within said fresh oil reservoir.

4,193,488

COIN-OPERATED WASHING MACHINE CYCLE TIME REDUCER

John W. Baum, Fisherville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jun. 8, 1978, Ser. No. 913,922
Int. Cl.[2] G07F *5/10*
U.S. Cl. 194—9 T **2 Claims**



1. In a coin-operated clothes washing machine of the type having a coin-operated mechanism, said coin-operated mechanism including a coin slide assembly adapted to be reciprocated after deposit of the correct coinage for operation of the clothes washing machine and further including a timer mechanism adapted to be set by reciprocation of said coin slide assembly by means including an actuation arm rotated by reciprocation of said coin slide assembly, wherein said actuation arm includes diverging wing portions, in combination:

a cycle time reducer shim mounted to said coin operated mechanism and interengaging with said coin slide assembly and said actuation arm to cause further advancement of the position of said actuation arm upon reciprocation of

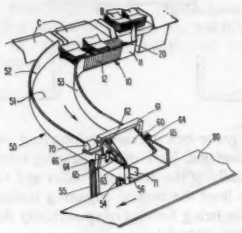
said coin assembly with said shim in position, and wherein said cycle time reducer shim is formed with engagement tabs snap-fitted over said diverging wing portions of said actuation arm to secure said shim to said actuation arm, whereby said cycle time of said clothes washing machine is shortened by advancement of said timer mechanism.

4,193,489

EXIT CONVEYOR SYSTEM FOR NEWSPAPER MAIL ROOM

Paul Siniscal, Hollis, N.H., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 14, 1977, Ser. No. 851,452
Int. Cl.[2] B65G *47/24*
U.S. Cl. 198—406 **5 Claims**



2. An exit conveyor system for handling bundles of newspapers in a newspaper mail room, said system including a bundle-spacing section comprising:

(a) a first series of power-driven rollers on which said bundles are received and conveyed;

(b) a final series of power-driven rollers for receiving and advancing bundles conveyed through said first series;

(c) means defining a common friction drive belt for rotationally driving said first and final series of rollers;

(d) a slow-down section intermediate said first and final series of rollers having;

(i) retardation means defining roller members with resistance means for resisting rotation thereof;

(e) a bundle turning section operatively associated with said final series of rollers defining an off-center endless belt having a width not greater than one half of the long dimension of a newspaper in the bundle including:

(i) driving means for advancing said bundles at a speed greater than that provided by said final series of rollers to effect angular rotation thereof.

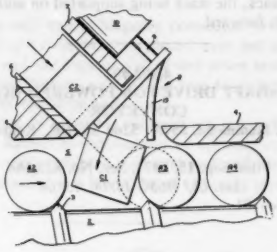
4,193,490

COLLATING APPARATUS

Jack S. Cooley, Atlanta, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed May 22, 1978, Ser. No. 908,402
Int. Cl.[2] B65G *47/04*
U.S. Cl. 198—451 **4 Claims**

1. Collating apparatus for inserting cubes into a moving row of cylindrical articles, said apparatus comprising a screw conveyor arranged to receive cylindrical articles and having a thread pitch which increases in the direction of article movement so as to establish spaces between predetermined articles, an auxiliary conveyor disposed at an acute angle to said screw conveyor and arranged to feed a continuous supply of cubes to said screw conveyor, the outfeed end of said auxiliary conveyor being disposed adjacent the part of said screw conveyor at which said spaces are sufficiently large to accommodate entry of a cube thereinto, and a movable cam disposed adjacent the outfeed end of said auxiliary conveyor and arranged to accommodate synchronous movement of a cube into the adjacent one of said spaces, said cam being rotatable and being provided with a guide portion for facilitating entry of a cube into one of said spaces and said cam being provided with a holding portion for engaging and holding a cube against movement along said auxiliary conveyor during entry of a preceding cube into one of said spaces and said cam being provided with



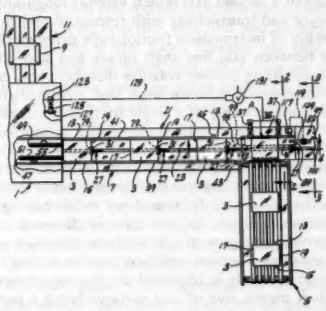
a clearance passage between said holding portion and said guide portion which accommodates movement of a cube off of said auxiliary conveyor while a succeeding cube is in engagement with said holding portion of said cam.

4,193,491

APPARATUS FOR FEEDING STACKS OF SHEETS, SUCH AS REAMS OF PAPER

Robert C. James, and Lloyd Kovacs, both of Sheboygan, Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Jun. 6, 1978, Ser. No. 912,953
Int. Cl.[2] B65G *37/00*
U.S. Cl. 198—476 **9 Claims**



1. Apparatus for feeding stacks of sheets, such as reams of paper or the like, comprising flight conveyor means for pushing the stacks forward, said flight conveyor means comprising a table having an upper surface on which stacks may slide, the table having a relatively narrow slot extending in the direction of feed, endless conveyor means having flights spaced at intervals along its length and extending outwardly therefrom for pushing the stacks along the table, said conveyor means having an upper reach extending under the table in the direction of feed and movable in the direction of feed, each flight having a relatively narrow section adapted, in its travel with the upper reach of the conveyor means, to extend up through said slot, and a relatively wide pusher face adapted, as the flight moves forward with the upper reach of the conveyor means, to travel over the table and push a stack forward on the table, each flight having a foot extending forwardly from its said pusher face adapted, in the travel of the flight with the upper reach of the conveyor means, to travel at a level for supporting the stack being pushed forward by said face, stacks being fed on to

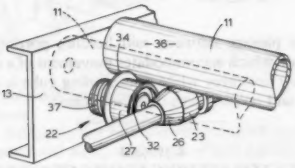
the table to a dwell position between successive flights for support by the table at a level below said level of said foot, and means for lifting a stack in its said dwell position to a level at which the lower surface of at least a portion of the stack is above said level of said foot for entry under the lifted stack of the foot of the flight coming into engagement with the trailing side of the stack, the stack being supported on said foot as said flight travels forward.

4,193,492

LINE SHAFT DRIVE FOR POWERED ROLLER CONVEYOR

Theodore A. Hammond, 3575 - 52nd St., SE., Kentwood, Mich. 49508

Filed Sep. 15, 1977, Ser. No. 833,584
Int. Cl.[2] B65G *13/06, 13/04*
U.S. Cl. 198—781 **20 Claims**



1. In a powered roller conveyor having a frame, a plurality of elongated conveyor rolls supported on said frame for rotation about respective first axes, said rolls being spaced at regular intervals in the longitudinal direction of the conveyor, and drive means for causing powered rotation of said conveyor rolls, said drive means including line shaft means extending longitudinally of said conveyor, said line shaft means being rotatable about a second axis which extends longitudinally of said conveyor and transversely with respect to said first axes, and a plurality of intermediate friction-type drive mechanisms connected between said line shaft means and said conveyor rolls for transmitting driving rotation therebetween, comprising the improvement wherein each said intermediate drive mechanism consists solely of a single friction drive roller supported for rotation about a third axis which is approximately parallel with but spaced from a respective one of said axes, said friction drive roller being disposed in direct frictional driving engagement with both said line shaft means and at least one of said conveyor rolls, said friction drive roller having a first toothless annular surface thereon directly disposed solely in frictional driving engagement with said one conveyor roll, said drive roller having a second toothless annular surface thereon directly disposed solely in frictional driving engagement with said line shaft means, one of said surfaces being a peripheral surface which faces radially outwardly of said drive roller, the other of said surfaces facing axially outwardly from one end of said drive roller, and biasing means for urging the friction drive roller into frictional driving engagement with said line shaft means.

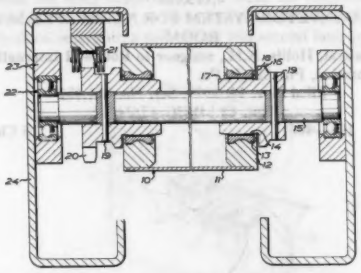
4,193,493

ROLLER CONVEYOR

Kjell G. Ekstrand, Ystad, Sweden, assignor to Transportteknik Gunnar Ekstrand AB, Sweden

Filed Oct. 18, 1977, Ser. No. 843,258
Claims priority, application Sweden, Oct. 19, 1976, 7611577
Int. Cl.[2] B65G *13/06*
U.S. Cl. 198—781 **4 Claims**

1. In a roller conveyor, a pair of side frame members, roller shaft bearings on said side frame members, substantially rigid roller shafts journaled on said bearings, solid comparatively thick and rigid bearing pieces fixed on each roller shaft in axially spaced relationship, a relatively less rigid conveyor roller for each roller shaft and having end bearing elements which are axially thick and rigid and engaged supportively with said bearing pieces each end bearing element having an outer end face defining one end face of said conveyor roller and extending axially inwardly thereof to a point near the inner end of one bearing piece, each end bearing element including a bearing insert having a cylindrical bore, the engaging surface



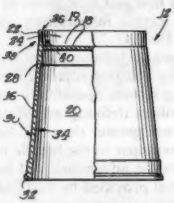
of each bearing piece being axially elongated and extending therefor said cylindrical bore of the bearing insert and being gently arched axially of the conveyor roller and said bore, and said insert and at least the arched engaging surface portion of each bearing piece being formed of specifically different compatible low friction materials.

4,193,494

CUP AND PACKAGE OF CUPS

John F. Green, Wood Dale, Ill., assignor to Compact Industries, Inc., Schaumburg, Ill.

Filed Aug. 28, 1978, Ser. No. 937,077
Int. Cl.[2] B65D *62/00, 85/72, 21/02*
U.S. Cl. 206—217 **6 Claims**



1. A package of nested disposable cups with deliquescent or hygroscopic material for use in dispensing beverages or food products comprising:

a plurality of disposable cups telescoped together into a nested stack, each of said cups being one piece and formed of foamed polystyrene plastic material and having a substantially frusto-conical, thick side wall with an interior foamed polystyrene surface for engaging said material, each of said cups having a rim at the upper end of said side wall defining an opening into said cup, each of said cups further having a planar bottom wall integrally joined to said side wall to define thereabove a food storage and liquid mixing chamber and a base wall integrally joined to said bottom wall and extending downwardly approximately 0.3 to 0.5 inch from said bottom wall to define therewith a cap seat and a bottom downwardly opening enclosure for being filled with the material while inverted, the outer side of said frusto-conical side wall extending in a continuous taper to said planar bottom wall; each of said base walls having an outer side offset radially inwardly of its side wall at a location beneath said planar bottom wall; said base walls having a cross-sectional thickness greater than the cross-sectional thickness of its side wall;

said side walls of said adjacent nested cups having a shoulder means integrally formed on the interior of the adjacent nested cup side wall for supporting said base wall above the bottom wall of the adjacent nested cup to provide a sealed enclosure bounded by said bottom walls, said base wall and the portions of side wall of the adjacent nested cup between said bottom walls; said shoulder means being spaced above said bottom wall by a distance not substantially greater than the depth of said downwardly opening enclosure;

a measured quantity of product in said sealed enclosure; and means for applying an endwise pressure to said stack to maintain said sealed enclosure.

4,193,495

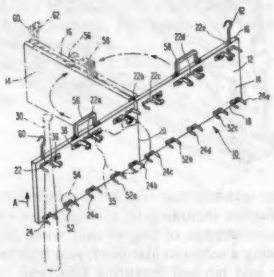
PORTABLE SPORTS EQUIPMENT ORGANIZER

Ronald Keeley, 6602 Hagerman St., Philadelphia, Pa. 19135

Filed Sep. 6, 1978, Ser. No. 940,074

Int. Cl.[2] B65D *85/00*; **A47F** *7/00, 5/08*

U.S. Cl. 206—315 R **17 Claims**



1. An apparatus for supporting, transporting and storing equipment used in baseball, softball, or similar games, said apparatus comprising:

a. a support member;

b. means for removably attaching at least one bat to said support member; and

c. means for removably attaching at least one helmet to said support member.

4,193,496

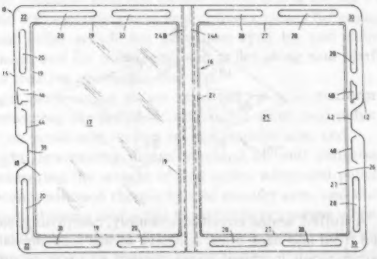
DISPOSABLE RECEIVER

Don C. Barratt, 4704 Butterfield Dr., Arlington, Tex. 76017

Continuation-in-part of Ser. No. 928,251, Jul. 26, 1978, Pat. No. 4,167,230. This application Oct. 20, 1978, Ser. No. 952,968

Int. Cl.[2] A61L *17/02*

U.S. Cl. 206—380 **21 Claims**



1. A reopenable disposable receiver for securely encasing sharps for disposal, comprising:

(a) a bottom tray having a bottom wall with side walls extending upwardly from said bottom wall and a flange extending outwardly around the upper periphery of said side walls;

(b) a top cover having a bottom wall with side walls extending upwardly from said bottom wall and a flange extending outwardly around the upper periphery of said side walls;

(c) wherein said tray is hingedly connected to said cover such that said cover may be placed over and nested into said tray with the bottom wall of said cover in close proximity to the bottom wall of said tray to securely encase sharps therebetween; and

(d) a plurality of retaining means types integrally formed into said flanges as indentations of opposite cooperating geometries for retaining said tray and said cover in the nested position via a hierarchy of retaining means.

4,193,497

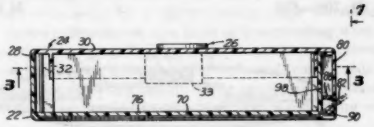
STORAGE AND SHIPPING CONTAINER

Peter McDermott, Irvington, and Lazzaro A. Fattori, Woodcliff Lake, both of N.J., assignors to Plastic Reel Corporation of America, Carlstadt, N.J.

Filed Mar. 14, 1978, Ser. No. 886,369

Int. Cl.[2] B65D *85/67, 11/16*

U.S. Cl. 206—387 **12 Claims**



1. A resilient plastic storage and shipping container for an article comprising first and second separable halves and means for releasably securing together said first and second halves, said first half having a first panel forming one side of said container and means for positioning the article on said first panel with all edges of said first panel extending beyond the article, said second half having a second panel forming the other side of said container and a resilient peripheral outer wall forming the end walls of said container, said first and second panels overlying one another in spaced relation when said halves are secured together, said peripheral outer wall having a free edge proximate but disengaged from said first panel when said havles are secured together, said peripheral outer wall being spaced from said positioning means and the article whereby blows and shocks applied to the end walls of said container during shipping will be absorbed by resilient deflection of said peripheral outer wall and will not be transmitted to the article.

4,193,498

MULTIPLE BOOKLET AND METHOD OF MAKING THE SAME

Sidney Rowling, Wynnewood, Pa., assignor to Spot-O-Gold Corporation, Philadelphia, Pa.

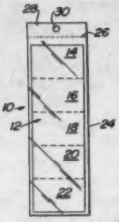
Continuation-in-part of Ser. No. 662,749, Mar. 1, 1976, which is a continuation of Ser. No. 541,307, Jan. 15, 1975, abandoned. This application Apr. 19, 1978, Ser. No. 897,873

Int. Cl.[2] B65D *75/40*; **B42D** *1/00*

U.S. Cl. 206—494 **10 Claims**

1. An article of manufacture comprising a plurality of booklets interconnected end to end in the form of a bookstrip, each booklet being printed with different images on the pages thereof, said bookstrip having only fold lines along one edge and the pages thereof being free from any fasteners, said strip having fold lines and two free edges along the opposite edge

thereof, said booklets being connected end to end and separable by perforation lines, said perforation lines including slits



substantially longer than the length of the tabs interconnecting the booklets.

4,193,499

PREFABRICATED UNITARY PACKAGE WHICH WHEN SEALED AND IRRADIATED CONFORMS CLOSELY TO CONTENTS AND BECOMES IMPACT-ABSORBING

Theodore W. Lookholder, 1262 Barrington, Apt. 304, Los Angeles, Calif. 90025

Filed Apr. 18, 1979, Ser. No. 31,175
Int. Cl.[2] B65D *81/12, 85/30*
U.S. Cl. 206—524 **24 Claims**

1. A prefabricated unitary protective package for articles, comprising:

a container having an outer wall and a conformable inner wall and adapted to sealably enclose such articles;

the outer and inner walls being permanently presealed to each other about their mutual peripheries, defining a permanently presealed chamber between the outer and inner walls; and

expandable material presealed in the chamber between the two walls and adapted to be expanded to an impact-absorbing state and thereby to force the inner wall conformingly against such articles.

4,193,500

BY-PASS DOOR ASSEMBLY

Victor J. Scott, Spring Lake, Mich., assignor to Leigh Products, Inc., Coopersville, Mich.

Division of Ser. No. 764,344, Jan. 31, 1977, Pat. No. 4,123,874.
This application Mar. 2, 1978, Ser. No. 882,595
Int. Cl.[2] B65D *69/00, 71/00*
U.S. Cl. 206—577 **4 Claims**

1. A kit usable with a rectangular panel to form a sliding door closure, said kit comprising:

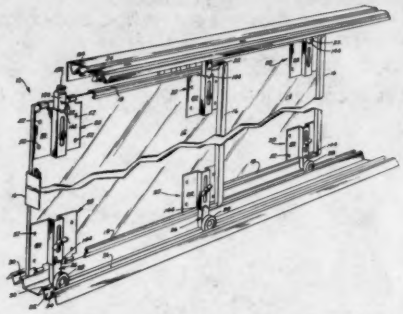
an upper trackway securable to the header of a door opening;

a lower trackway securable to the threshhold of a door opening;

a pair of stiles, each adapted to snap fit over a lateral edge of the rectangular panel, said stiles each being an elongated, slot free member having spaced front and rear walls joined by a side wall to define a panel receiving channel, said rear wall including a first portion angled with respect to said side wall towards said front wall, a second portion angled with respect to said first portion towards said side wall, a curved portion integral with said second portion and engaging the inner surface of said side wall, a third portion integral with said curved portion and angled away from said side wall and parallel to said second portion, and a fourth reverse bent portion angled towards said front wall and said side wall and terminating in a sharp edge disposed within said channel;

a pair of trim pieces, each adapted to snap fit over a transverse edge of said panel to frame said panel in conjunction with said stiles, said trim pieces each being an elongated slot free member having spaced front and rear walls joined by a base wall to define a channel, said rear wall defining an elongated, semi-circular groove;

a plurality of corner brackets, each corner bracket including a central housing and outwardly extending wings, said wings each including tabs positioned so that said bracket is securable to said stiles and said panel by snapping said tabs



under said stile rear wall reverse bent portion, said brackets further including an L-shaped tab extending from a transverse edge of one of said wing members, said tab defining a semi-circular bead, said trim member snapping over said tab and capturing said bead within said elongated groove;

a pair of roller means each including a roller adapted to engage one of said trackways for supporting the framed panel in a top hung or bottom roller configuration, said roller means being adjustably positionable within said bracket housing; and

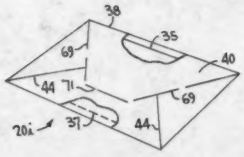
a pair of guide means each adjustably positionable within said bracket housing for engaging one of said trackways and guiding said sliding door closure.

4,193,501

ENVELOPE ASSEMBLY

Robert H. Allen, North Tonawanda, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Sep. 23, 1977, Ser. No. 835,959
Int. Cl.[2] B65D *27/34, 27/10*
U.S. Cl. 206—610 **8 Claims**



1. A stuffed, sealed envelope assembly, comprising, superimposed front and back plies, adhesive means securing said plies together along marginal edges thereof to form an envelope pocket within the assembly, insert material disposed within said pocket and being removably attached along one marginal edge thereof to said plies, means lying adjacent one of said marginal edges of said plies for opening said pocket and expos-

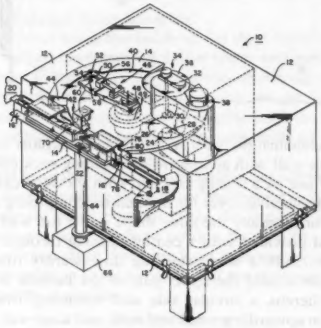
ing said insert material for extraction therefrom, said means comprising at least one cut line extending through only one of said plies and defining a pocket access opening, said cut line lying near one end of another marginal edge of said insert material, said adhesive means securing said plies together along said one marginal edge thereof comprising a stream of releasable glue to thereby further comprise said means for opening and exposing, said cut line partially delimiting a portion of said one ply which may be separated along said another marginal edge from the remainder of said one ply upon insertion of an opener through said access opening, the other of said plies being completely devoid of any means facilitating opening of said pocket, whereby said pocket may be opened and said insert material exposed for extraction therefrom as said portion is separated from said remainder of said one ply upon application by the opener of a force causing the separation after the opener is inserted through said access opening.

4,193,502

PELLET DIMENSION CHECKER

Anthony R. Marmo, Cheswick, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 29, 1977, Ser. No. 792,290
Int. Cl.[2] B07C *5/09, 5/16*
U.S. Cl. 209—555 **11 Claims**



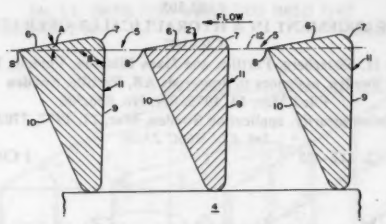
1. A pellet dimension checker comprising:
a housing;
delivery means disposed near said housing for conveying a pellet to and from said housing;
a platform having a hole therein mounted on said housing and adjacent to said delivery means for supporting said pellet;
a transfer arm mounted on said platform and having a first end rotatably attached to said platform and having a second end extending near said delivery means for engaging said pellet which has been conveyed by said delivery means and for transfering said pellet along said platform by rotating about said first end;
length determining means mounted on said platform for measuring the length of said pellet when said pellet has been positioned therein by said transfer arm; and
weight determining means mounted on said platform for measuring the weight of said pellet when said pellet has been positioned therein by said transfer arm, said transfer arm returning said pellet to said delivery means when said length determining means and said weight determining means have determined that the length and weight of said pellet are within predetermined limits and said transfer arm positioning said pellet over said hole in said platform when said pellet is determined not to be within said predetermined limits.

4,193,503

SLURRY SCREEN

James D. Connolly, 410 Johnston St., Princeton, W. Va. 24740

Filed Jul. 17, 1978, Ser. No. 925,637
Int. Cl.[2] B07B *1/12*
U.S. Cl. 209—393 **6 Claims**



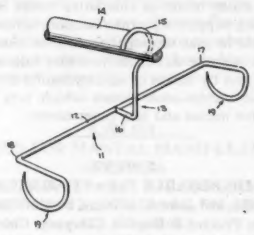
1. A slurry screen for separating fibrous and other solids from a slurry flowing longitudinally of the screen on and rearwardly along a flow surface thereof, comprising parallel spaced screen wires disposed transversely of said screen and interconnected by underlying spaced tie rods disposed longitudinally of said screen, said screen wires together forming said flow surface, each wire having downwardly converging leading and trailing sides and a rearwardly declined flat top bounded rearwardly by a sharp trailing edge for directing slurry flowing thereacross to a front of a succeeding wire, and a cylindrically convex leading edge on each wire extending between and merging tangentially with said leading side and top thereof for receiving and directing upwardly onto said top part of the slurry passed to said wire from a preceding wire.

4,193,504

HANGER FOR HANGING FABRIC

Milton Berkowitz, 500 E. 85 St., New York, N.Y. 10028

Continuation of Ser. No. 668,928, Mar. 22, 1976, abandoned. This application Mar. 28, 1978, Ser. No. 890,923
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—119 **7 Claims**



1. A hanger for use in hanging fabric comprising:
a longitudinally extending main member;
a first support member connected to one end of said main member at a point of attachment;
a second support member connected to the other end of said main member at a point of attachment;
a first mounting member rigidly connected to said first support member;
a second mounting member rigidly connected to said second support member, said first and second mounting members each extending substantially downwardly from the support member to which it is connected and thereafter upwardly toward the point of attachment of the support member to which it is connected, and said first and second mounting members each terminating in a pointed end

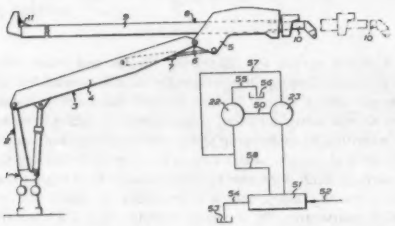
portion disposed adjacent to the point of attachment of the support member to which it is connected, whereby the pointed end portion can pierce the fabric and whereby said first and second support members shield the pointed end portions.

4,193,505

ARRANGEMENT IN A HYDRAULICALLY OPERATED CRANE

Lars H. Slitterberg, Partille, and Hans Eliasson, Vindeln, both of Sweden, assignors to Jonsereds AB, Partille, Sweden

Filed Mar. 14, 1978, Ser. No. 886,500
Claims priority, application Sweden, Mar. 21, 1977, 7703196
Int. Cl.[2] B66C *23/06*
U.S. Cl. 212—55 **2 Claims**



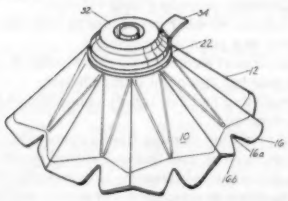
1. A hydraulically operated crane comprising a supporting crane section, an outer boom displaceably supported and guided in said supporting crane section, an inner boom displaceably supported and guided in said outer boom, hydraulic drive means disposed at the outer side of said supporting crane section and including at least one hydraulic motor, transmission means for moving said booms with respect to each other and to said supporting crane section, a guide member on the other boom, and at least one flexible hose or line extending from said supporting crane section over said guide member on the outer boom into said outer boom at the rear end thereof and into the inner boom at the rear end of the inner boom and on to the front end of the inner boom, said hydraulic drive means for moving said two booms in operation effecting displacement of said inner boom by a distance equal with respect to displacement of the outer boom as this latter boom is moved with respect to said supporting crane section, wherein the outer boom movable in said supporting crane section is extensibly positioned in opposite directions to either side of the supporting crane section by means of said hydraulic drive means and a part of said transmission means which acts between said hydraulic drive means and said outer boom.

4,193,506

DISPOSABLE INFANT NURSER

Dean D. Trindle, and John S. Amneus, both of Cincinnati, Ohio, assignors to Procter & Gamble Company, Cincinnati, Ohio

Filed May 15, 1978, Ser. No. 906,122
Int. Cl.[2] A61J *9/08*
U.S. Cl. 215—11 C **22 Claims**



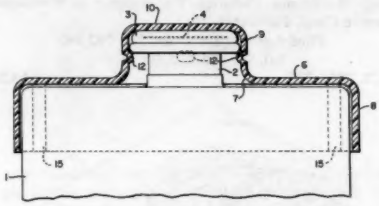
1. A disposable infant nurser comprising a pliable container bag formed of first and second superposed sheets of resilient, liquid-impermeable film material secured together along their mating peripheral edges, said edges having a corolla-like configuration of alternating inward and outward scallops; an orifice positioned centrally of said first sheet; a relatively rigid, upstanding circular neck extending outwardly from said orifice and secured to said first sheet circumferentially of said orifice, said neck including means for holding said nurser projecting radially outwardly adjacent the base of said neck; apertured nipple means releasably secured to said neck; and a removable cover overlying said nipple means and holding it in retracted position substantially within the confines of said neck.

4,193,507

COVER FOR BREATHING APPARATUS CANISTER

Layton A. Wise, Washington, and Robert F. Menold, Monroeville, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Feb. 9, 1979, Ser. No. 10,600
Int. Cl.[2] B65D *41/18*
U.S. Cl. 215—12 R **5 Claims**



1. The combination with a breathing apparatus canister having a top wall with an upwardly extending neck encircled at its upper end by a sealing ring and with the neck closed by a seal, of a protective cover for the canister comprising a body portion of substantially the same shape as the top wall of the canister and provided with a central opening through which said neck extends, a skirt extending downwardly from said body portion around the upper part of the canister in close proximity thereto, a circular side wall extending from said body portion upwardly around said neck, and a top wall joined to said side wall and covering said ring and seal, said side wall being provided at circumferentially spaced intervals with inwardly projecting detents underlying portions of the sealing ring to hold the cover in place, said detents being sufficiently yieldable to permit the cover to be applied and pulled off the canister manually.

4,193,508

CAP REMOVER AND CLOSURE

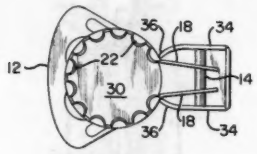
Imre Cziraki, 15611 Sunflower La., Huntington Beach, Calif. 92647

Filed Apr. 26, 1977, Ser. No. 791,138
Int. Cl.[2] B65D *45/32*
U.S. Cl. 215—226 **3 Claims**

1. In a replacement closure for use on the end of a container neck, such as that of a bottle having an annular end against which an original closure cap gasket is adapted to sealingly engage and a ridge surrounding the neck adapted to be engaged by the original cap, such as a crown or threaded cap, for maintaining the original closure cap in its sealing engagement, comprising; a cup shaped member including a circular band portion adapted to extend partially around the outer end of said neck having a plurality of angular spaced jaws for engaging said ridge and having a gasket therein for sealingly engaging said annular end of the neck when the jaws are moved radially inwardly, said band portion terminating in a pair of generally parallel outwardly projecting spaced wings adapted

to be moved toward and away from each other, the jaws adapted to engage the ridge when moved toward each other and effect sealing by the gasket and adapted to release engagement of the jaws from the ridge when moved away from each other, a lever having one end pivotally connected to the wings and swingable between a first limit position extending outwardly from the wings, and a second limit position in which its other end lies on top of the cup-shaped member, the lever having a pair of cams engagable with outwardly facing portions of the wings for moving same toward each other when the lever is swung toward its second limit position and for locking same against retrograde movement, the improvements, in combination, comprising;

(a) said jaws being bent angularly inwardly to cammingly engage beneath said annular end,



(b) said spaced wings being flat,

(c) said lever being blanked from flat sheet metal with parallel spaced bends normal to the blank, and pivotally connected to the wings, the spaced bends having projections therefrom bent angularly inwardly toward each other, their terminal ends being engagable with the flat wings immediately adjacent their junctures with the band portion,

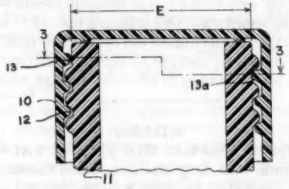
(d) said lever including: a third cam formed as a bend normal to the plane of the blank at one end thereof engagable with inwardly facing portions of the flat wings adjacent their junctures with the band portion for moving same away from each other when the lever is swung toward its first limit position to aid in removal of the replacement closure from the container.

4,193,509

CLOSURE HAVING HIGH RETENTION TORQUE CHARACTERISTICS

C. E. Lee Dunn, Jr., Toccoa, and Carl A. Miller, Cornelia, both of Ga., assignors to The AFA Corporation, Miami Lakes, Fla.

Filed Aug. 30, 1978, Ser. No. 938,198
Int. Cl.² B65D *41/04*
U.S. Cl. 215—330 **17 Claims**



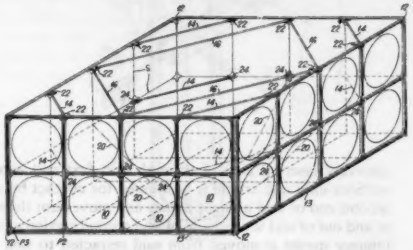
1. A threaded cylindrical closure, having a closed top, for a standard threaded container, said closure having a first portion of the closure's thread increased in depth, the base of said thread being at a substantially constant radial distance from the cylindrical axis of said closure, and the said portion located on the closure on its uppermost thread with respect to the closure's top.

4,193,510

LIQUID STORAGE TANK

Sidney Weston, Sedgley, England, assignor to Northern Engineering Industries Limited, Gateshead, England

Filed Dec. 8, 1977, Ser. No. 858,490
Claims priority, application United Kingdom, Jan. 11, 1977, 986/77
Int. Cl.² B65D *7/02*; G65D *7/00*; B65D *7/42*
U.S. Cl. 220—5 A **10 Claims**



1. A liquid storage tank having a floor and walls each made up of rectangular moulded panels of reinforced synthetic plastic material, each said panel comprising a wall the periphery of the panel at the corner of the wall being relieved, the wall having at the periphery thereof a flange integral therewith extending away therefrom and the wall having at least one stiffening formation integral therewith, said panels in each said wall and in said floor being secured together by first securement means engaging adjacent flanges of said panels, said tank further comprising auxiliary members each occupying a space defined by adjacent corners of said panels, each said auxiliary member having formation means restricting relative displacement of respective flanges of adjacent panels transversely of said adjacent panels, at least certain of said auxiliary members each having integral lug means positioned within said tank, said tank further comprising bracing means positioned wholly within said tank secured within said tank by second securement means to said lug means of said certain auxiliary members, and said tank further comprising seal element means held compressed by said first securement means in sealing relationship with said adjacent panels between adjacent flanges thereof and held compressed between said auxiliary members and respective surrounding panels in sealing relationship therewith by said first securement means.

4,193,511

APPARATUS FOR MANUAL MANIPULATION OF ARTICLES

Gilbert L. Taber, R.D. 2, Lockpit Rd., Clyde, N.Y. 14433

Filed May 12, 1978, Ser. No. 905,218
Int. Cl.² A47F *1/12*; B65G *11/14*
U.S. Cl. 221—66 **8 Claims**

1. Apparatus for manually manipulating articles from a first to a second location comprising:

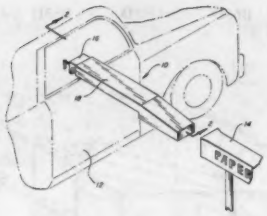
(a) fixed support means;

(b) a first, hollow, tubular section attached to said fixed support means and having a first open end positioned at said first location, and a second open end;

(c) a second, hollow, tubular section mounted upon said first member for telescoping movement between retracted and extended positions with respect thereto and having a first open end communicating with said second open end of said first member, and a second open end positioned at said second location; and

(d) plunger means mounted for longitudinal sliding movement with respect to both of said tubular sections and having a first end positioned for manual manipulation at said first location and a second end positioned within said

second section for movement between a retracted position therein and an extended position substantially adjacent said second end of said second section, whereby a succession of articles may be manually inserted in said first end of said first section, each article being moved by the successively inserted articles through said first and second sections until one article is positioned for contact by said second end of said plunger means and movement thereby to and out of said second end of said second section as said plunger means is moved from said retracted to said extended position.

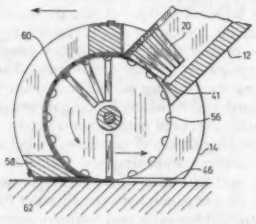


4,193,512

DEVICE FOR ARRANGING PLAYING ELEMENTS

Gordon D. Buxton, and John W. Buxton, both of 94 Mosedale Cres., Willowdale, Ontario, Canada (M2J 3A4)

Filed May 1, 1978, Ser. No. 901,844
Int. Cl.[2] B65G *29/02, 59/06;* A63H *33/00*
U.S. Cl. 221—185 **3 Claims**



1. A device for arranging playing elements in an upstanding disposition on a surface, with predetermined spacings between adjacent ones of said playing elements, said device comprising:

a playing element storage means in the form of an open channel having suspension means for receiving and suspending therein a plurality of playing elements in inverted disposition and in substantial alignment with one another;

a rotatable member disposed adjacent to the storage means and rotatable with respect thereto, the rotatable member being adapted to roll across said surface, and having the form of a centrally journalled wheel structure comprising a wheel housing fixedly secured secured to the storage means and two parallel spaced apart circular discs, of substantially the same radius and mounted for rotation relative to the storage channel, about their common center axis;

said wheel housing further including a liner structure extending around a part of the circumference of the discs and in close proximity to the edges thereof;

playing piece receiving means adapted to receive a playing piece from the storage means in response to rotation of the rotatable member with respect to the storage means, and release the playing piece in upstanding disposition on the surface as a result of rolling the rotatable member across said surface, said playing piece receiving means comprising suspending formations in the form of indentations at the peripheral edges of said discs, said indentations being provided in axially registered pairs, one on each disc, adapted to receive therein lateral, non-circular cross-sectioned projections of one end of a body portion of a playing piece, so as to suspend the playing piece between the discs;

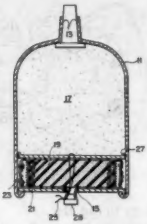
said liner structure being disposed sufficiently closely to the peripheral edge of the discs to prevent substantial angular movement of the projections of the playing piece received in said indentations, relative to the discs as the discs rotate.

4,193,513

NON-AEROSOL TYPE DISPENSER

Glen C. Bull, Jr., P.O. Box 686, Alexandria, Va. 22313

Filed Apr. 19, 1977, Ser. No. 789,004
Int. Cl.[2] G01F *11/00*
U.S. Cl. 222—1 **15 Claims**



1. The method of dispensing material from a container having an orifice by means of an expandable member comprising the steps of,

disposing within the container a combination spring and compressable mass of cellular intersticed material having the property of changing volume between expanded and compressable conditions within the container from substantially the entire volume of the container to a fraction of its volume;

compressing the spring and mass to produce a void space within the container;

filling the void space within the container with material to be dispensed;

releasing the spring and mass for simultaneous expansion of the combination of the spring and compressable mass to fill the void replacing dispensed material and thereby to force material through said orifice, wherein the spring cooperates with the mass and supplies thereto additional expansion force asserted against the materials,

enclosing the spring and mass together with the plate in an impermeable plastic bag having a venting portion exposed to the atmosphere via an opening in the container evacuating the bag when the spring and mass are compressed, sealing the vent with a cap to maintain the spring and mass in a compressed state, and releasing the cap to vent air into the bag thereby to release the spring and mass for expansion of volume by entry of air thereinto thereby producing a force for dispensing of material through said orifice.

4,193,514

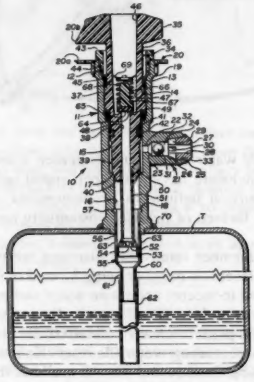
LIQUID AND GAS DISPENSING VALVE

Hall Langstroth, 1454 Alegriano Ave., Coral Gables, Fla. 33146

Filed Dec. 15, 1978, Ser. No. 969,857
Int. Cl.[2] B65D *83/14*
U.S. Cl. 222—4 **10 Claims**

1. A liquid and gas dispensing valve for pressurized supply tanks comprising, in combination, an integrally-formed, elongated valve body member having an end-to-end through opening, an annular valve seat intermediate the ends of said through opening, said through opening being internally threaded near one end of said valve body member, an elongated, cylindrical

valve stem member receivable in said through opening and having an externally-threaded portion interthreadingly engagable with said internally-threaded portion of said valve body member, the inner end portion of said valve stem member defining an annular tip portion seatable on said annular valve seat, said valve body member comprising an outwardly-extending dispensing port having an internal bore communicating with said through opening in said valve body member at a position therealong between said annular valve seat and said internally-threaded portion, an elongated, tubular, inner sleeve member coaxially secured at one end to said inner end portion of said valve stem member and extensible outwardly of the other end of said valve body member, a tubular outer sleeve member, means securing one end portion of said outer sleeve member within said through opening of said valve body member at said other end thereof, in coaxial relation with respect to said inner sleeve member and extending outwardly thereof, peripheral side wall through opening means in the said outer sleeve member for the through flow of pressurized gas to be dispensed, said inner sleeve member at its outer end being formed with an increased-diameter cylindrical portion substantially circumjacent interior wall portions of said outer sleeve member and being operative to gradually block said through opening means in said outer sleeve member upon said valve stem member being unscrewed with respect to said valve body member from the seated position with respect thereto, said inner sleeve member being provided, inwardly of said increased-diameter portion thereof, with through opening means to permit the flow of pressurized liquid therethrough from the outer end of said outer sleeve member.



4,193,515

LIQUID PROPORTIONING DEVICE WITH INSUFFICIENT SUPPLY AND FLOW VALVES

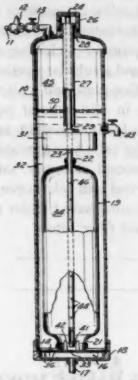
Chester A. Purdy, R.F.D. No. 1, Belmont, Wis. 53510

Continuation-in-part of Ser. No. 663,513, Mar. 6, 1976, abandoned. This application Jul. 7, 1977, Ser. No. 813,535

Int. Cl.[2] **B67D** *5/34*

U.S. Cl. 222—57 **20 Claims**

1. A liquid proportioning apparatus for dispensing a liquid concentrate diluted with a liquid diluent comprising a diluent reservoir for a supply of diluent, a concentrate reservoir for a supply of concentrate in fluid pressure communication with said diluent, and metering means for receiving diluent from said diluent reservoir and concentrate from said concentrate reservoir and for mixing them in desired porportions, and control means in response to sufficient levels of one of said liquids in said reservoirs to allow continuous dispensing of said liquid concentrate diluted with said liquid diluent in said desired proportions and operable in response to an insufficient level of said one of said liquids within its reservoir to terminate flow of the other of said liquids, said reservoir which contains said other liquid being a flexible container located within the reservoir which contains said one liquid, said metering means includes an orifice open to said other liquid, a filler tube is provided to supply said other liquid to said flexible container, and the lower end of said filler tube operates to engage and close said orifice when said control means responds to an insufficient supply of said one liquid.



4,193,516

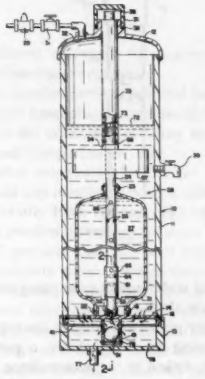
LIQUID PROPORTIONER FOR MIXING TWO LIQUIDS IN A PREDETERMINED RATIO

Chester A. Purdy, and George A. Purdy, both of Belmont, Wis., assignors to Purdy Proportioners, Ltd., Belmont, Wis.

Filed Jun. 23, 1977, Ser. No. 809,456

Int. Cl.[2] **B54D** *35/22*

U.S. Cl. 222—57 **20 Claims**



1. A proportioner for mixing two liquids in a first substantially predetermined ratio over a substantial range of flow rates comprising first and second separate chambers each adapted to contain one of said two liquids, means adapted to maintain said liquids in said first and second chambers at substantially the same pressure, a mixing chamber maintained at a pressure lower than the pressure in said first and second chambers when said proportioner is operating, a first orifice system including a plurality of first orifices connected in parallel between said first chamber and said mixing chamber, a second orifice system including a plurality of second orifices connected in series between said second chamber and said mixing chamber, each

of said first orifices having a hydrodynamic equivalent value which is greater than the hydrodynamic equivalent value of the said second orifice system by a positive ratio, the number of said first orifices times each of their positive ratios equaling said first predetermined ratio, the number of said first orifices divided by one being substantially less than said first predetermined ratio, said proportioner including an orifice assembly having an orifice plate and a tubular portion, said first orifices being formed in said orifice plate and a plurality of said second orifices being mounted in said tubular portion, said tubular portion being centrally located within said proportioner, a vertically extending filler tube being provided to allow addition of liquid to said second chamber, said filler tube being provided with a cylindrical end telescoping over said tubular portion and laterally locating said tubular end while allowing vertical movement of said filler tube.

4,193,517

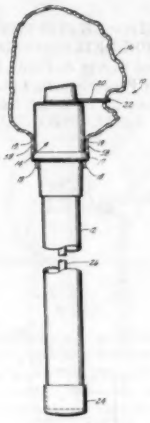
WATER SQUIRT CANE HAVING MOVABLE FIGURE AS ACTIVATOR

Warren N. Fetty, and Rosabelle Fetty, both of Altadena, Calif., assignors to Wham-O Mfg. Co., San Gabriel, Calif.

Filed Sep. 6, 1977, Ser. No. 830,840

Int. Cl.[2] **B05B** *17/00*

U.S. Cl. 222—78 **12 Claims**



1. A hand operated water squirt cane comprising:

an elongated hollow shaft;

a reciprocal plunger pump mounted at the top of the shaft, the pump including an accumulator, a pump operating lever operatively linked to the accumulator, a spray head incorporated into the operating lever, an inlet communicating with the accumulator and an outlet communicating with the spray head;

a head reciprocally mounted at the top of the cane enclosing the pump;

means for filling the interior of the shaft with water;

elongated conduit means communicating between the hollow interior of the shaft and the inlet to the pump;

aperture means communicating with the pump outlet; and

hollow tubular means communicating between the aperture means and the exterior of the head whereby reciprocating hand operations of the pump causes intermittent squirts of water to be emitted from the top of the cane.

4,193,518

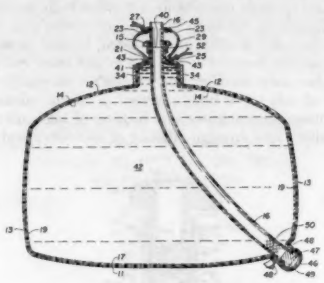
PORTABLE WATER CARRIER AND DISPENSER

William A. Holmes, 209 Highland Ave., Piedmont, Calif. 94611

Filed May 4, 1977, Ser. No. 793,678

Int. Cl.[2] **B65D** *37/00;* **A45F** *3/20*

U.S. Cl. 222—105 **11 Claims**



1. A portable water carrier and dispenser, comprising:

a bag-like enclosure having an open ended side wall and a bottom portion defining a predetermined volume, said enclosure formed of flexible substantially non-elastic material;

a reservoir member removably disposed within the enclosure, said reservoir member being formed of flexible material adapted to receive and retain water and provided with a configuration having volumetric dimensions at least as large as the predetermined volume of the enclosure such that when containing water the reservoir member will be supported by the side and bottom walls of the enclosure;

siphon means to establish fluid communication with the reservoir member for allowing water contained in the reservoir member to be siphoned therefrom, the siphon means including a flexible tube having one end extending into and removably attached to the bottom of the reservoir member;

a first closure member fabricated from an elongate elasticized material that is multiply-wrapped and releasably attaches circumferentially about the flexible tube at a predetermined point along said tube, the reservoir being gathered about the flexible tube by the first closure member to establish a water-impervious seal between the flexible tube and the reservoir;

second and third closure members releasably attached to the flexible tube in juxtaposed relation to the first closure member and said first closure member being interjacent said second and third closure members, the enclosure being gathered about and held to the flexible tube by the second and third closure members; and

a pair of shoulder straps connected to the enclosure for mounting the water carrier and dispenser on the back of a person.

4,193,519

LIQUID DISPENSING CLOSURE HAVING CAPILLARY BORES

Werner F. Dubach, Butzackerstrasse 10, CH-8304 Wallisellen, and Hansruedi Kessler, Bahnofstrasse 10, CH-8215 Hallau, both of Switzerland

Filed Dec. 13, 1977, Ser. No. 860,407

Claims priority, application Switzerland, Dec. 15, 1976, 15755/76

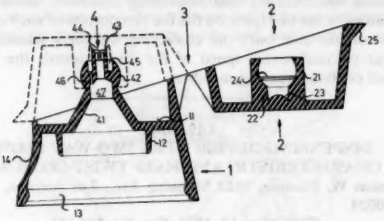
Int. Cl.[2] **B67D** *3/00*

U.S. Cl. 222—111 **18 Claims**

1. A plastic closure for a liquid holding container comprising a body and cap, said body being adapted to be secured to the container and including a tip having an outlet bore there-

through, the bore having an inner end and an outer end, said closure being characterized by:

said tip including a tubular part surrounded by an annular bulge, said part and bulge defining an annular channel therebetween adjacent the distal end of the tip, said bore extending through said part and including a central opening intermediate said ends, said bore decreasing in size from said inner end to said outer end whereby as liquid is



expelled from the container and flows out through the bore the flow velocity is increased from the inner end to the outer end, said tip including capillary bores extending from said channel to said central opening through which air flows inwardly as the liquid is so expelled and is expelled along with the liquid; and

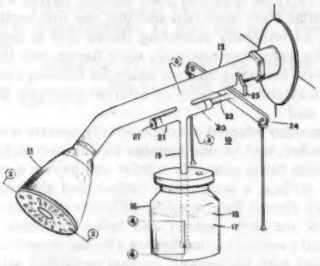
said cap having a member adapted to fit about said tip and engage said bulge.

4,193,520

DEVICE FOR ADDING SOAP TO SHOWER WATER

Robert Duffield, R.D. #2, New Alexandria, Pa. 15670

Filed Aug. 31, 1977, Ser. No. 829,213
Int. Cl.[2] B67D *5/60*
U.S. Cl. 222—133 **2 Claims**



1. A device for adding soap to shower water comprising:

a. a sleeve member open on one end, situated in a water source leading to a shower nozzle, said open end directed toward the shower nozzle;

b. a depending tube member connected to the sleeve member;

c. a liquid soap container attached to the tube member, one end of the tube member being situated preferrably below the level of liquid soap in the container;

d. means for drawing soap through the depending tube member by harnessing the negative pressure, relative to the atmosphere, of the sleeve member when water is flowing through the water source;

e. said means for drawing soap further comprising:

a first control member situated on the depending tube member;

a second control member situated within the first control member and having an aperture positioned within the depending tube member, said second control member being rotatable within the first control member to permit either the unobstructed or obstructed flow of soap through the depending tube member determined by the position of the aperture when rotated;

a rope member attached to the second control members to assist a user in rotating the control member;

a stop member situated on the water source placed above the rope member in a manner to permit the rotation of the control member so that unobstructed flow exists through the aperture and depending tube member when desired and;

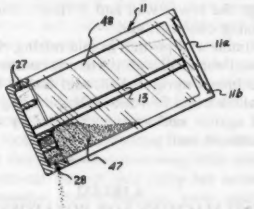
means for controlling the volume of soap flowing through the depending tube member and connected to it.

4,193,521

DUAL CONDIMENT DISPENSER

William E. Bounds, 23790 Hawthorne Blvd., Torrance, Calif. 90505

Filed Jun. 5, 1978, Ser. No. 912,733
Int. Cl.[2] A47G *19/24*
U.S. Cl. 222—142.4 **6 Claims**



1. A condiment dispenser for separately dispensing two different condiments, comprising:

a container member having side and bottom wall portions,

a divider wall extending longitudinally from the bottom to the top of the container, dividing the container into first and second compartments, and

a cap member removably fitted over the top of said container, said cap member having a side wall portion which extends axially from the top edge of the container and a top wall portion extending between the top edges of the side wall portion, said side wall portion having first and second aperture means formed therein located above the first and second compartments respectively, and a first and second block-shaped baffle member formed in said cap member opposite said first and second aperture means respectively, each of said baffle members comprising end and side walls forming a chamber having an open bottom so as to provide fluid communication between the chambers of said first and second baffle members and said first and second compartments respectively, and a deflector member forming the inner surface of the end wall of the chamber and having a triangular cross-section with the apex of said triangle being directly opposite the associated aperture means, said deflector member being non-apertured such that the flow of condiment therethrough is prevented,

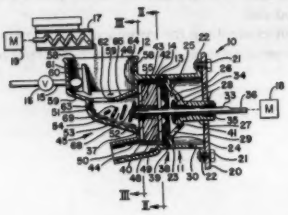
whereby when condiment is purposely dispensed from one of said compartments, condiment in the other of said compartments is deflected so that it tends not to be dispensed inadvertently from its associated aperture means.

4,193,522

DISPENSING MACHINE MIXING DEVICE AND HOUSING THEREFOR

Loren C. Edelbach, Maple Grove, Minn., assignor to The Cornelius Company, Anoka, Minn.

Filed Jul. 27, 1978, Ser. No. 928,761
Int. Cl.[2] B67D *5/60*
U.S. Cl. 222—145 **20 Claims**



1. A dispensing machine mixing device for the mixing together of concentrate and diluent, comprising:

(a) first and second end walls and a tubular wall therebetween, said walls enclosing and defining a beverage mixing chamber therewithin;

(b) means within the mixing chamber for effecting turbulent mixing motion therein;

(c) a funnel having an upright wall, a lower wall extending downward from the upright wall, and an outlet port through the lower wall and in fluid communication with the mixing chamber, and

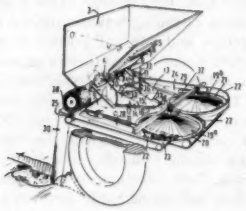
(d) a common wall portion in said mixing chamber first end wall, said common wall portion is common to and is part of said funnel upright wall, said funnel being materially integral with said first end wall and being vertically overlapped against said mixing chamber by virtue of and at said common wall portion.

4,193,523

PLANTING MACHINE FOR POTATOES, BULBS OR SIMILAR SEED CROP

Nicolaas P. Koning, Reviusstraat 118, Alkmaar, Netherlands

Filed Feb. 21, 1978, Ser. No. 879,513
Claims priority, application Netherlands, Feb. 21, 1977, 7701847
Int. Cl.[2] B67D *5/52;* **A01C** *9/08*
U.S. Cl. 222—254 **13 Claims**



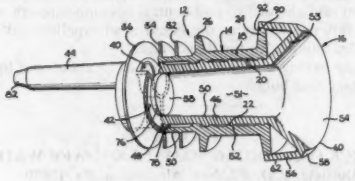
1. A planting machine for potatoes, bulbs or similar seed crop comprising a hopper and a conveying and distributing device adjoining an outlet port of said hopper for feeding the potatoes or the like to the planting foot, characterised in that the conveying and distributing device is formed by a conveyor belt extending beneath the outlet port of the hopper and having above the conveyor belt two discs rotating in opposite senses and being located side by side adjacent one another, said discs having the shape of an obtuse cone with an adjoining, annular, flat outer rim located just above the conveying surface of the belt, the adjacent parts of the discs moving in the same direction as the conveyor belt, said discs being surrounded on the side remote from the hopper through a circumferential angle of about 180° with a slight interspace by an upright rim, and at the opposite sides of the conveyor belt conveying members are arranged to be movable in opposite direction to that of the conveyor belt, said conveying members having pick-up ends lying beneath the outer rims of the respective discs and delivery ends lying above the planting foot, there being provided pick-up members on said conveying members causing the potatoes or the like lying on the flat rim portion of each disc to slide off the disc onto the conveying members wherein the linear circumferential speed of the discs exceeds the linear speed of the conveying members.

4,193,524

DISPENSING DEVICE WITH TWO-WAY FLOW CHARACTERISTIC AND HALF TWIST CLOSURE

Thomas W. Fleming, 1623 Manning Ave., Los Angeles, Calif. 90024

Filed Mar. 13, 1978, Ser. No. 886,051
Int. Cl.[2] B67D *3/04*
U.S. Cl. 222—484 **5 Claims**



1. A dispensing device for a container comprising:

a first member adapted to be disposed in a passageway of a content carrying container, said member having a generally tubular body with two sections, the first section including an internally extending thread and at least one externally extending relatively rigid flange, and the second section including internal means for forming a content passageway and a plurality of external relatively flexible flanges; and

a second member adapted to cooperatively operate with said first member, said second member having two sections, a first section being generally tubular and having a smooth internal surface, a sealing end surface and an externally extending thread for engaging the internally extending thread of the first member and being moveable there along; and a second section having a funnel shaped surface contiguous with the smooth internal surface of said first section and an annular leg for forming an operating surface, said second member being moveable between a closed position in which said sealing end surface engages said internal passageway forming means for blocking the flow of content, and an opened position in which said second member is moved along said threads to disengage said sealing end surface and said passageway forming means to allow content flow; and

said annular leg and funnel shaped surface intersect to form an edge, said annular leg including an annular concave surface adjoining said edge.

4,193,525

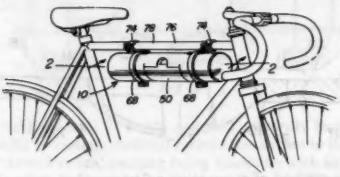
BICYCLE ATTACHED BEVERAGE CONTAINER CARRIER

Garold L. Sommers, 1770 Whitney, Idaho Falls, Id. 83401

Filed Jul. 5, 1978, Ser. No. 922,362
Int. Cl.[2] B65D *11/02;* **B62J** *7/02*
U.S. Cl. 224—35 **7 Claims**

1. A small personal sized beverage container carrier for

containing and insulating elongated beverage containers against ambient heat transfer relative thereto, said carrier comprising loosely telescopingly related inner and outer cylindrical shells defining an annular space between the opposing outer and inner surfaces thereof, said inner and outer cylindrical shells having radially registered substantially rectangular openings formed through corresponding wall portions thereof intermediate the opposite ends thereof and with said openings oriented longitudinally of said shells, one of said shells including generally radially projecting integral flange means extending about the corresponding opening and at least substantially bridging the radial spacing between said wall portions, said



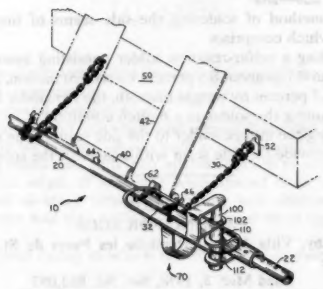
outer shell including end walls closing the opposite ends thereof outwardly of the corresponding ends of said inner shell, said inner shell including closure walls closing the opposite ends thereof inwardly of said end walls, insulation disposed between the opposing outer and inner surfaces of said shells and end and closure walls, a heat insulative partial cylindrical door hingedly supported from said carrier and swingable between open and closed positions providing unobstructed access through and closing said openings, one of the shells including radially extending circumferentially spaced ribs spanning the radial spacing between said one shell and the other shell.

4,193,526

TWO-WHEELED VEHICLE CARRIER

Donald D. Rosmarinofski, 13 Blue Jay Rd., Lynnfield, Mass. 01940

Filed Jul. 27, 1977, Ser. No. 819,399
Int. Cl.[2] B60R *9/10*
U.S. Cl. 224—273 **4 Claims**



1. A two-wheeled vehicle carrier for a vehicle having a tow-bar comprising:

(a) carry-bar means detachably connecting with and substantially horizontal to said tow-bar and having at each end thereof a pair of series of horizontal adjustment slots wherein one series of said horizontal adjustment slots is located on one side of said carry-bar means and is directly above the other series of said horizontal adjustment slots located on the other side of said carry-bar means;

(b) a pair of ring means mounted to the back portion of said vehicle having a tow-bar;

(c) a pair of chain members having a plurality of links and fixedly mounted to said carry-bar means on one end then extending to said tow-bar and detachably connecting to the ends thereof, each of said chain members further extendable to said ring means and therethrough and back upon itself and having an open link on the other end thereof to interconnect with a link thereof to lock said chain member in the desired position to take up slack and prevent swaying of said two-wheeled vehicle carrier when in use;

(d) a pair of wheel cradle means detachably and pivotally mounted to said carry-bar means and having a substantially horizontal loop member to encircle the bottom of a wheel of said two-wheeled vehicle and further having a substantially vertical metal strip fixedly mounted on one end to the outside of said substantially horizontal loop member and extending downwardly therefrom to a rounded portion thereof and then upwardly to the inside of said substantially horizontal loop member and then to said mounting means to rest the wheel of said two-wheeled vehicle thereon and having a substantially round coupling rod means fixedly mounted to each of said wheel cradle means,

(e) a pair of mounting means detachably and pivotally connecting said pair of wheel cradle means to said carry-bar means, each of said mounting means including an annular sleeve member having a pair of a series of mounting holes wherein one series of said mounting holes is located on one side of said annular sleeve member and the other series of said mounting holes is located on the opposite side of said annular sleeve member, each said annular sleeve member adapted to be fitted over an end of said carry-bar means and slidably adjustable over the pair of horizontal adjustment slots associated with that end of said carry-bar means, a substantially round coupling rod receiving slot fixedly mounted to each of said annular sleeve members and adapted to be pivotable around the circumference of said receiving slot;

(f) detachable locking pin means adapted to be fitted through said annular sleeve member mounting holes and said horizontal adjustment slots of said carry-bar means so as to lock the annular sleeve member onto said carry-bar means;

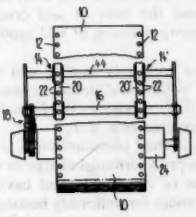
(g) a pin means welded to and transfixing said carry-bar means and having a concavely tapered end thereof adapted to and abutting said tow-bar to align and stabilize said carry-bar means.

4,193,527

TRANSPORT DEVICE FOR A BORDER-PERFORATED STRIP-LIKE WEB OF DATA RECORDING MATERIAL

Albert Rutishauser, Rutihofstrasse 40, 8713 Verikon, Switzerland

Filed Apr. 4, 1978, Ser. No. 893,536
Claims priority, application Switzerland, Apr. 7, 1977, 4415/77
Int. Cl.[2] G03B *1/30*
U.S. Cl. 226—74 **14 Claims**



1. In a transport device for transporting a strip-like web of

data recording material having perforations and including an endless transport belt having projecting pins for engaging said perforations and being trained around two wheels at least one of which is a drive wheel, the improvement comprising:

said drive wheel having a plurality of sprockets, and

each said pin having a recess for driving engagement by a said sprocket,

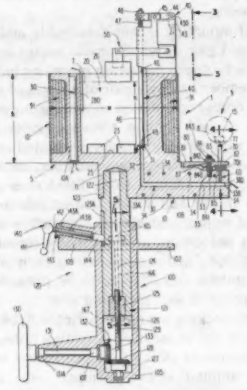
said sprockets and recesses being configured relative to each other to effect a substantially frictionless relative rolling motion as between any said sprocket and recess at least as they engage and disengage.

4,193,528

APPARATUS FOR DELIVERY OF SOLDER

James R. Early, Rosemont, Pa., and Donald C. Lobach, Marlton, N.J., assignors to Campbell Soup Company, Camden, N.J.

Filed Apr. 11, 1978, Ser. No. 895,400
Int. Cl.² B23K *1/08*
U.S. Cl. 228—37 **14 Claims**



1. A solder delivery apparatus for delivery of molten solder to an applicator for soldering the side seams of can bodies moving in a predetermined path comprising:

a one-piece housing having a unitary body portion having first and second sections;

first means including a crucible formed in said first section of said unitary body portion for continuously melting and uniformly heating the molten solder and maintaining same for continuous delivery therefrom all in a manner which substantially eliminates the formation of hot spots and temperature gradients within said first means and said molten solder;

a solder gate in fluid communication with said crucible and located in said second section of said unitary body portion of said one-piece housing forming a unitary channel to carry said molten solder therethrough, said solder gate having a mouth communicating with said crucible and positioned above the floor of said crucible to provide unimpeded gravity delivery of said molten solder therefrom;

second means for uniformly heating and maintaining said molten solder within said unitary channel in a manner which substantially eliminates the formation of hot spots and temperature gradients; and

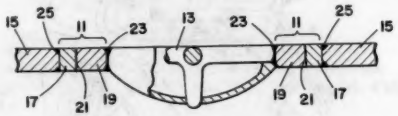
applicator means in fluid communication with said channel for delivering a predetermined charge of molten solder to said side seams of can bodies and having third means associated therewith for uniformly heating said applicator means in a manner which substantially eliminates the formation of hot spots and temperature gradients in said applicator means and said molten solder therein.

4,193,529

METHOD FOR INTERCONNECTING DISSIMILAR METALS WELDING TO AN EXPLOSIVELY BONDED BIMETALLIC COUPLING

Charles B. Dick, Port Orchard, Wash.; Curtis L. Knutson, Tulsa, Okla.; Frederick W. Jones, Upper Marlboro, and Richard D. Ireland, Chevy Chase, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 761,917, Jan. 24, 1977, Pat. No. 4,099,661.
This application Mar. 13, 1978, Ser. No. 885,422
Int. Cl.² B23K *28/02*
U.S. Cl. 228—107 **3 Claims**



1. The method of connecting a first member made of a first material to a second member made of a second material comprising the steps of:

(a) explosively bonding a third member made of said first material to a fourth member made of said second material;

(b) welding said first member made of said first material to said third member made of said first material;

(c) welding said second member of said second material to said fourth member made of said second material; and

(d) configuring said third and said fourth member as uniform annuli, said third member interior to and concentric with said fourth member and the exterior surface of said third member explosively bonded along its entire length to the interior surface of said fourth member.

4,193,530

METHOD OF SOLDERING TINPLATE CAN BODIES WITH A SULFUR RESISTANT TIN-ALLOY SOLDER

Edward W. Holmes, Darien, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed May 16, 1978, Ser. No. 906,392
Int. Cl.² B22D *11/126*
U.S. Cl. 228—263 **3 Claims**

1. A method of soldering the side seams of tinplate can bodies which comprises

providing a sulfur-resistant solder consisting essentially of about 0.1 to about 0.5 percent by weight indium, about 0.1 to 0.5 percent by weight bismuth, the remainder being tin,

maintaining the solder in a molten condition,

applying the molten solder to the side seam of the can body to provide the side seam with a layer of the solder.

4,193,531

PACKING FOR EGGS

Marc Saby, Villa Maeva, Domicile les Parcs de St. Tropez, France

Filed Mar. 3, 1978, Ser. No. 883,097
Claims priority, application France, Mar. 8, 1977, 77 07731
Int. Cl.² B65D *45/00*
U.S. Cl. 229—2.5 EC **4 Claims**

1. A packing for the transportation of eggs, comprising:

(a) a base having a plurality of integrally formed receptacles,

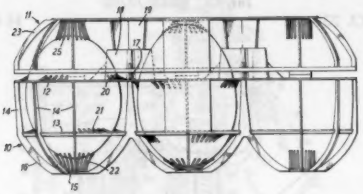
(b) a lid having the same number of integrally formed receptacles and positioned to coincide with those in the base,

(c) a first annular series of radially inwardly extending flexible filaments disposed within each of said receptacles in the base,

(d) a second annular series of radially inwardly extending flexible filaments disposed within each of said base receptacles and located above said first series,

(e) a plurality of upwardly extending filamental support elements within the receptacles in the base, and

(f) a plurality of downwardly extending filamental elements fixed to the tops of the insides of the receptacles in the lid, whereby the two annular series of flexible filaments whilst permitting entry of the eggs restrict movement of the eggs



in the horizontal direction and said upwardly and downwardly extending filaments restrict movement in the vertical direction, said packing being stackable with like packings when in the open position, wherein the filaments of the first annular series are angularly offset from those of the second series in plan thereby to facilitate stacking of empty packings.

4,193,532

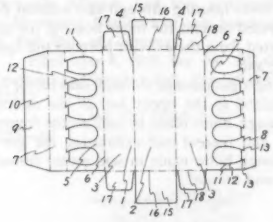
CONTAINER WITH AN INTERNAL DIVIDER

Hachiro Okubo, Osaka, Japan, assignor to Kinki Printing Company, Ltd., Osaka, Japan

Filed Jun. 21, 1978, Ser. No. 917,651

Int. Cl.[2] B65D *5/50*

U.S. Cl. 229—28 R **2 Claims**



1. A container with a dividing device formed from a single bent blank, comprising:

(a) flat central dividing means;

(b) v-shaped inner side walls, said side walls having openings therein for holding objects such as bottles, said side walls being positioned with their apexes opposed to each other and the edges of said side walls spaced from said flat central dividing means for holding said objects firmly between said side walls and said central dividing means; and

(c) an outer casing in which said bent blank is positioned.

4,193,533

BOX CONSTRUCTION

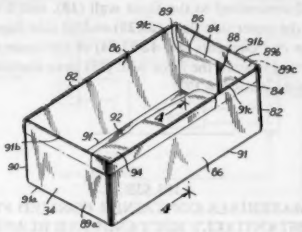
Kenneth B. Schulman, New York, N.Y., assignor to Millen Industries, Inc., New York, N.Y.

Filed Aug. 31, 1978, Ser. No. 938,334

Int. Cl.[2] B65D *5/22*

U.S. Cl. 229—34 R **1 Claim**

1. A box structure formed from a blank covered on one side thereof with a first paper wrap, the box structure comprising a substantially flat central portion, side walls adjacent to and substantially perpendicular to a first pair of opposite edges of the central portion, each of said side walls comprising a double layer of material formed by folding a marginal portion of the blank onto itself such that the first paper wrap covers the interior surfaces of said walls, each of said side walls also having a pair of double layer and extensions of substantially the same size and adapted to be sent inwardly and joined to form the interior end walls of the box, each of said interior end walls having an upper portion and a lower portion, and exterior end walls adjacent to and substantially perpendicular to a second pair of opposite edges of the central portion, each said pair of double layer end extensions being joined to form an interior



end wall of the box at substantially the midpoint of the adjacent exterior end wall of the box, each of said exterior end walls including an end wall lip adapted to be bent inwardly over and to cover the upper portion of each of said interior end walls to form a box having the first paper wrap extending over the entire exterior surface of the box and continuing over each interior end wall of the box and along the interior surface of each of said side walls to one edge of said first pair of opposite edges of the central portion of the box.

4,193,534

FOLDABLE BLANKS AND STRIPS FOR THE PRODUCTION OF FLIP-TOP CIGARETTE BOXES

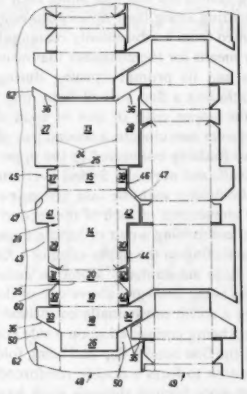
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Nov. 15, 1978, Ser. No. 961,074

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757251

Int. Cl.[2] B65D *5/34*

U.S. Cl. 229—44 CB **20 Claims**



1. A material blank from which a rectangular box of the hinged lid or flip-top type may be folded, said blank including longitudinally successive surface areas defined by fold lines

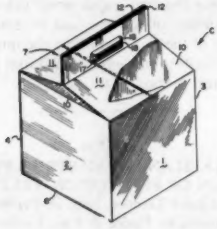
and comprising front, floor and back walls of a main box portion and back, ceiling and front walls of a hinged lid, and laterally projecting side flaps, lid side flaps, floor corner flaps and lid corner flaps adapted to form main box portion side walls and lid side walls by their overlapped folding, characterized by: a portion of inner side flaps (29,30) connected to the back wall (14) and directed toward the lid (11), inner lid side flaps (31,32) connected to the sides of the back lid wall (20) and lid corner flaps (39,40) connected to the upper lid wall (19) having a total length at least as great as the length of outer side flaps (27,28) connected to the front wall (13), and a narrower width than the outer side flaps (27,28) and lid side flaps (33,34), and wherein end elements (41, 42;53,54) of the inner side flaps (29,30) directed toward the floor wall (15) have the same width as the box side walls (16,17).

4,193,535

BULK MATERIALS CONTAINER FORMED FROM SUBSTANTIALLY RECTANGULAR BLANK

Harold J. Griffith, Galesburg, Ill., assignor to Alton Box Board Company, Alton, Ill.

Filed Sep. 18, 1978, Ser. No. 942,926
Int. Cl.[2] B65D *5/10, 5/46*
U.S. Cl. 229—52 B **4 Claims**



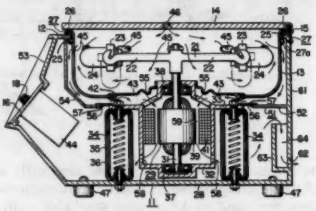
1. An enclosed container for holding bulk materials, such as candy or the like, and being formed from a blank that is substantially rectangular in dimensions, comprising, said container being folded from paperboard stock and formed having front, side, rear walls, and a bottom wall, all of said front, side, and rear walls being connected together along their sides with the bottom wall securing along their downward edges to provide a container formed from a substantially rectangular blank, and openable cover means for the container that insures the carrying capabilities and its prompt opening during usage, said cover means including a first pair of flaps, one flap foldably connected to the upper edge of one of each side wall and normally folded over into closure, a second pair of flaps, one of each second flap foldably connected to the upper edge of said front and rear walls and normally folded over into closure and in overlying relationship with the said first pair of flaps, hand panels foldably connecting to each of the second pair of flaps, each hand panel comprising a pair of handle flaps, one of each handle flaps connecting to the upper edge of a flap of the said second pair of flaps substantially along its entire width, the other handle flap being arranged above one of the first pair of flaps and having a width substantially equivalent thereto, said other handle flap being connected upon a side edge thereof to the side edge of the first handle flap and being folded over into contiguity therewith to form a doubly reinforced hand panel, therebeing hand slots formed through each handle flap and with said slots being in registry, and each hand panel being folded over into adjacency in the formed container with the respective hand slots being aligned to accommodate the facile insertion of the hand therethrough.

4,193,536

COOLING STRUCTURE FOR A CENTRIFUGE

Tokihito Kubota, Tokyo, Japan, assignor to Kabushiki Kaisha Kubota Seisakusho, Tokyo, Japan

Filed Sep. 15, 1978, Ser. No. 943,268
Claims priority, application Japan, Sep. 24, 1977, 52/128750[U]
Int. Cl.[2] B04B *15/02*
U.S. Cl. 233—11 **14 Claims**



1. A cooling structure for a centrifuge comprising:
an outer casing;
an inner housing mounted in the outer casing;
a rotor disposed in the inner housing;
a motor comprising a motor frame disposed in the outer casing under the inner housing, said motor including a shaft for driving the rotor;
exhaust ports formed in the peripheral wall of the inner housing for exhausting therefrom gas blown off by the rotation of the rotor;
a lid covering the inner housing and having an intake for drawing gas into the inner housing as gas is exhausted from said inner housing through said exhaust ports;
a guide provided around the inner housing for guiding the gas exhausted from the exhaust ports to the upper end of the motor; and
means defining a gas passage through said motor for passing the gas guided to the upper end of the motor into the motor through holes made in said motor frame adjacent the upper end thereof and exhausting the gas from the motor through holes made in said motor frame adjacent the lower end thereof.

4,193,537

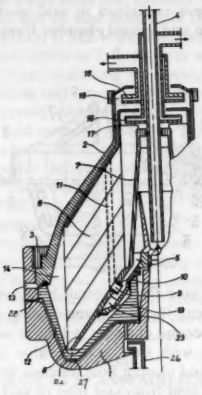
CENTRIFUGAL SEPARATOR WITH PRESEDIMENTATION MEANS

Berth I. A. Bodelson, Tullinge, and Mats B. Nordenberg, Tumba, both of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Oct. 23, 1978, Ser. No. 953,933
Claims priority, application Sweden, Nov. 1, 1977, 7712307
Int. Cl.[2] B04B *1/14*
U.S. Cl. 233—20 A **5 Claims**

1. A centrifugal separator comprising a rotor forming a separating space and also a peripheral space for receiving separated sludge from the separating space, the rotor having peripheral outlets for discharging the separated sludge, a valve bowl movable axially in the rotor to open and close said sludge outlets, a stack of conical separation disks in said separating space, the rotor having a central inlet chamber for receiving a sludge-containing mixture to be centrifuged, a distributor forming a conical wall having openings through which said inlet chamber is connected to said separating space, the rotor also having opposed annualar surfaces fixed relative to the rotor and forming between the surfaces an annular slot through which said inlet chamber is connected to said peripheral sludge space independently of said wall openings, there being a presedimentation space located radially outward from said openings and leading from said inlet chamber to said annular slot, and annular flexible valve means for said slot, said valve

means being fixed to the rotor and having one side directed toward the presedimentation space and an opposite side directed toward the peripheral sludge space, said valve means



being operable to close said slot when subjected to substantially equal liquid pressures on said sides thereof and to open said slot upon creation of a substantial pressure difference on said sides in response to opening of said sludge outlets.

4,193,538

APPARATUS FOR SEPARATING AND MEASURING SAMPLE COMPONENTS

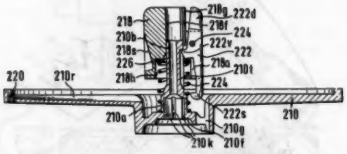
Gerhard Schwarz, Munich, Fed. Rep. of Germany, assignor to Compur-Electronic Gesellschaft mit beschrankter Haftung, Munich, Fed. Rep. of Germany

Filed May 4, 1978, Ser. No. 902,684

Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722322

Int. Cl.[2] **B04B** *5/00*

U.S. Cl. 233—26 **6 Claims**



1. A centrifugal device for analyzing samples, comprising a driving shaft (**212**), a coupling part (**216**) fixed to said shaft, said coupling part having axially extending coupling teeth (**216***k*), a plate shaped rotor (**210**) for receiving capillary tubes arranged radially on the rotor to enable centrifugal force to be applied to the contents of such tubes, said rotor having a central opening for receiving said coupling part and having coupling grooves (**210***k*) mating with said coupling teeth of said coupling part when said rotor is seated on said coupling part, said rotor being removable in an axial direction from said coupling part, a fixing part (**218**) movable axially with respect to said shaft, said fixing part having portions for engaging and holding the inner ends of capillary tubes arranged radially on said rotor, a spring (**224**) tending to move said fixing part axially away from said rotor, and a locking lever (**222**) pivotally mounted on said fixing part and having a nose (**222***s*) for engaging a portion of said coupling part to latch said fixing part in an operative position close to said rotor against the force of said spring.

4,193,539

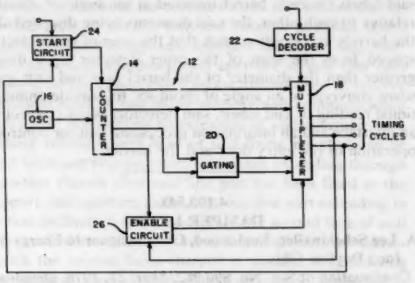
SIGNAL GENERATOR

Rodney V. Bowman, and Martin H. Francis, both of Wichita, Kans., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 7, 1977, Ser. No. 849,383

Int. Cl.[2] **H03K** *23/02, 21/12*

U.S. Cl. 235—92 NG **17 Claims**



1. Control signal generating means capable of generating a plurality of different timing cycles comprising:

multi-stage shift register means having outputs from a plurality of said stages;

at least one selectively effective delay means interposed between successive stages of said shift register means;

start means coupled to said shift register means for initiating and disabling operation of said shift register means;

means for clocking said multi-stage shift register means;

multiplexer means to which a plurality of said outputs from various stages of said shift register means are applied and from which said timing cycles are taken; and

selection means for controlling said multiplexer means to select desired outputs from the shift register means for application to a utilizing device.

4,193,540

APPARATUS FOR AND METHOD OF AUTOMATICALLY IDENTIFYING BARRELS

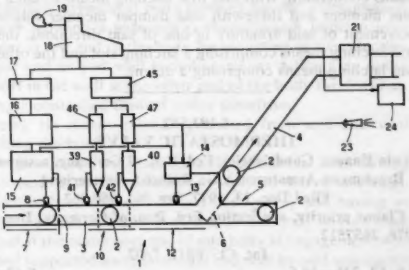
Roland Dougados, Strasbourg; François Pierrot, Souffelweyersheim, and Remy Wagner, Strasbourg Meinau, all of France, assignors to Brasseries Kronenbourg, France

Filed Mar. 23, 1978, Ser. No. 889,495

Claims priority, application France, Jun. 21, 1977, 77 19550

Int. Cl.[2] **G06K** *7/10;* **G01D** *21/04;* **G06K** *9/00*

U.S. Cl. 235—454 **6 Claims**



1. Apparatus for automatically identifying barrels having machine readable codes on an end face thereof comprising a main conveyor for conveying the barrels therealong in a vertical orientation while exposing the code bearing end faces thereof, a secondary diversion conveyor extending from the

main conveyor and separated therefrom by a barrier, a flow control assembly associated with the main conveyor comprising an entry door and a passage detector controlling movement of the barrels through the entry door, a barrel detection region downstream of the flow control assembly with two spaced detectors for scanning and reading the code on the upper faces of the barrels, which latter carry a plurality of identification labels bearing identical codes with at least two of said labels on each barrel oriented at an angle of about 45° relative to each other, the said detectors being disposed above the barrels in a position such that the scan of one detector is spaced from the scan of the other detector by a distance greater than the diameter of the barrel face and said spaced scans converge at an angle of about 45° to provide omnidirectional reading of said labels, said detectors being connected to an interface and an information processing unit for controlling operation of the entry door and the barrier.

4,193,541

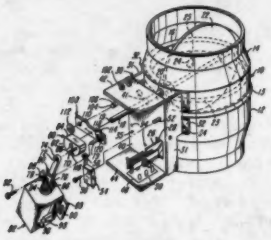
DAMPER LATCH

A. Lee Scheidweiler, Englewood, Ohio, assignor to Energy Vent, Inc., Dayton, Ohio

Continuation of Ser. No. 890,082, Mar. 27, 1978, abandoned. This application Sep. 28, 1978, Ser. No. 946,594

Int. Cl.[2] **G05D** *23/00*

U.S. Cl. 236—1 G **11 Claims**



1. In a mechanism for positioning a damper member between respective positions opening and substantially closing a flue, said mechanism comprising motive means having an armature, means eccentrically linking said armature to a rotatable cam member drivingly engaged to said damper member, and yieldable means opposing movement of said armature in a first direction for returning said armature in an opposite direction upon de-energization of said motive means; the improvement wherein said cam member has first latching means, and including a latch member and means coupling said latch member to said armature, said latch member having second latching means cooperating with said first latching means to latch said cam member and therewith said damper member following movement of said armature in one of said directions, one of said latching means comprising a latching slot and the other of said latching means comprising a detent.

4,193,542

THERMOSTATIC VALVE

Erwin Knauss, Gundelsheim, Fed. Rep. of Germany, assignor to Braukmann Armaturen A.G., Rothrist, Switzerland

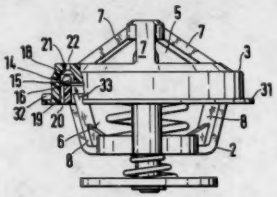
Filed Dec. 13, 1977, Ser. No. 860,062

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1976, 2657512

Int. Cl.[2] **F01P** *7/02*

U.S. Cl. 236—34.5 **8 Claims**

1. A thermostatic valve for controlling liquid flow comprising a housing formed of first and second interconnecting parts providing a first chamber in which is located a first valve seat and co-operating valve plate operable by a thermostatic element located in said first chamber to permit liquid flow therethrough past said valve plate, first and second passages in said interconnected parts forming an inlet and an outlet respectively to said first chamber, a second chamber formed by said interconnected parts, exterior of said first chamber, said second chamber being intermediate of said inlet and said outlet, a closing float element contained in said second chamber, a second valve seat in said second chamber forming an exit from



said outlet, said closing float element being engageable with said second valve seat, the arrangement being such that liquid flow through said second chamber will have said closing float element to engage with said second valve seat but during disengagement of said closing float element from said second valve seat, air may vent from said inlet to said outlet through said second chamber.

4,193,543

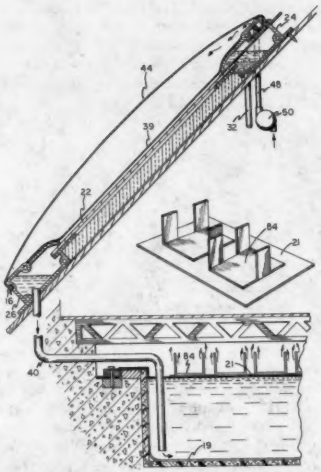
SOLAR HEATING SYSTEM

Eric A. Viesturs, 680-B Heritage Village, and Gundar E. Viesturs, Oak Hill Dr., both of Southbury, Conn. 06488

Filed Feb. 23, 1978, Ser. No. 880,379

Int. Cl.[2] **F24D** *11/00*

U.S. Cl. 126—430 **5 Claims**



1. A solar heating system for a building having an inclined roof, side walls and a removable sectional bottom floor, said system comprising:

a closed hollow water proof chamber disposed below said bottom floor, said chamber being partially filled with water and containing air;

a solar heat collector disposed in the roof, said collector having upper and lower spaced horizontal hollow members and a flat collector sheet having a roughened black top surface inclinedly disposed therebetween, the upper member having a water inlet and an elongated horizontal opening, the horizontal opening extending along the length of the upper member adjacent the sheet, said lower

member having a water outlet and an elongated horizontal slot, said slot extending along the length of the lower member adjacent said sheet;

first means interconnecting said chamber and said water inlet to pump water from said chamber to said inlet, said water flowing out of said horizontal opening over said sheet for collection in said lower member, the water being heated by solar action as it flows over said sheet;

second means interconnecting said water outlet to said chamber to drain said heated water into said chamber;

a slidable perforated plate extending through said upper member and said opening, said plate being slidable to any position between fully closed and fully open to regulate the flow of water through said opening accordingly, and thus regulate the temperature of the water heated by flow along said plate;

a flexible transparent plastic cover;

third means detachably securing said cover to said upper and lower members, said cover extending over said sheet to protect same for external weather conditions; and

fourth means to introduce air under pressure between said cover and said sheet to inflate said cover.

4,193,544

RAIL CLIP ASSEMBLIES

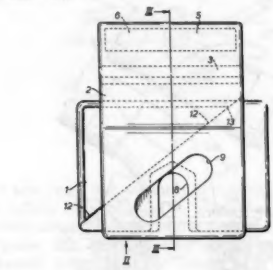
Ian M. Marchant, Ashtead, and Warwick S. Faville, London, both of England, assignors to Kins Developments Limited, Epsom, England

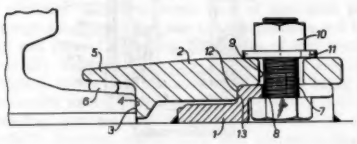
Continuation of Ser. No. 700,811, Jun. 29, 1976, abandoned. This application Feb. 16, 1978, Ser. No. 878,591

Claims priority, application United Kingdom, Jun. 30, 1975, 27516/75

Int. Cl.[2] E01B 9/00

U.S. Cl. 238—347 **11 Claims**





1. A rail clip assembly for securing a rail to a support, said assembly comprising: a first part to be fixed relative to the rail support adjacent the rail and having a first face adapted to face the rail and extend generally parallel thereto, and a second face extending from said first face away from said rail in a direction inclined at an acute angle to the longitudinal direction of the rail; a second part adapted to overlie said first part and having first and second relatively inclined faces, said first and second faces being on a portion of said second part which in use extends between said second face of said first part and said rail with the first face of said portion being in abutment with a longitudinally extending face of the rail and with the second face of said portion being in abutment with said second face of said first part in all relative positions of said parts for transmitting to said first part laterally directed forces applied to said second part by the rail, fixing means for fixing said second part to said first part independently of fixing of said first part to said rail support, said fixing means including a member having an enlarged head for engagement in said first part and a shank, said parts each having an aperture therein which align with each other and through which said shank of said fixing member extends when said second faces are in abutment, said aperture in said second part being elongated in a direction parallel with the direction of extent of the second face of said second part to enable said parts to assume different relative positions when said shank extends through said aperture and while said abutted faces remain in abutment, said aperture in said first part extending at its lower end into a recess dimensioned to receive said enlarged head of said fixing member and communicating through a slot, constituting an extension of said aperture, with an opening whereby said head of said fixing member can be engaged with said first part with said shank extending through said aperture therein after said first part has been fixed to the rail support, said aperture and slot in said first part extending in a direction inclined to said direction of the second face of said first part such that when said first and second parts are assembled with the second faces thereof in abutment, said fixing member extends through said aligned apertures therein but is prevented by said second part from moving through said slot in said first part.

4,193,545

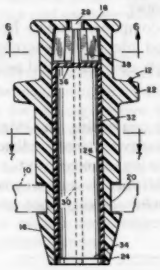
PRESSURE COMPENSATING EMITTER

Glenn G. Havens, La Mesa, Calif., assignor to Bayshore Creative Products, Inc., National City, Calif.

Filed Aug. 7, 1978, Ser. No. 931,922

Int. Cl.[2] B05B 1/30, 15/02

U.S. Cl. 239—109 **15 Claims**



1. A pressure compensating emitter for irrigation systems comprising:

a generally cylindrical body member having a longitudinal bore defining a passageway therethrough with an inlet port at one end of the body for mounting in a conduction line and an end wall including means defining an outlet port in the wall at the other end of the body for distributing a controlled flow of water therefrom,

spacing rib means extending inward from said end wall along the bore,

a flexible imperforate substantially cylindrical boot having an outer diameter substantially equal to that of said longitudinal bore mounted in said passageway and having an open end at said inlet port end of said body and a closed end at the outlet port end of said body in engagement with and supported away from said end wall by said spacing rib means, and

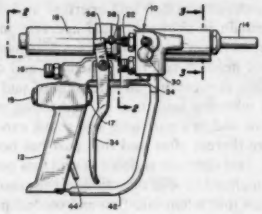
elongated rib means extending along said passageway between the walls of said boot and said bore for biasing and supporting the wall of said boot adjacent said rib away from the wall of said bore for maintaining a flow path between said inlet port and said outlet port.

4,193,546

HIGH-VISCOSITY VOLUME BALANCING MIXING HEAD

Robert D. Hetherington, Sunland, and David W. Goelz, Burbank, both of Calif., assignors to Poly-Glas Systems, Sun Valley, Calif.

Filed Sep. 19, 1977, Ser. No. 834,037
Int. Cl.[2] B05B *15/02*
U.S. Cl. 239—112 **18 Claims**



1. An apparatus for mixing and dispensing a plurality of reactive components comprising:

a body;

a mixing chamber in said body having an inlet and exit ports;

a nozzle secured in said exit port;

a pair of component inlet ports in said body;

a pair of passageways intersecting at the inlet to said mixing chamber connecting said inlet ports to said mixing chamber;

a pair of valves in said passageways near said intersection of said passageways for controlling the flow of material to said mixing chamber;

means to connect component supply hoses directly to said body through said inlet ports, whereby the reactive components are closely coupled to said pair of valves and said mixing chamber;

a third inlet port;

a third passageway connecting said third inlet port to said first pair of passageways intermediate said pair of inlet ports and said mixing chamber; and

valve means in said third passageway whereby said body may be flushed with cleaning materials after use.

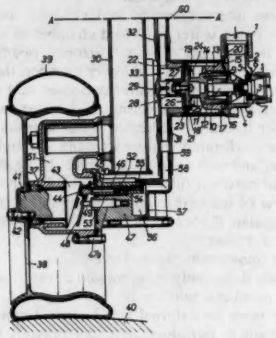
4,193,547

MOBILE APPARATUS FOR SPREADING LIQUIDS AT A CONSTANT VOLUME PER UNIT SURFACE AREA

Vincent P. M. Ballu, Epernay, France, assignor to Tecnoma, Epernay, France

Filed Sep. 25, 1978, Ser. No. 945,790
Claims priority, application France, Sep. 26, 1977, 77 28895
Int. Cl.[2] B05B *9/06*
U.S. Cl. 239—156 **7 Claims**

1. Mobile apparatus for spreading a constant volume of liquid per unit area of surface in spite of variations in speed of travel, comprising a spreading liquid circuit, an auxiliary liquid circuit, a pressure regulator connected in the spreading circuit for regulating the liquid pressure therein in response to said auxiliary liquid circuit, a bracket, a tubular arm pivotally mounted at one end on said bracket, said auxiliary circuit being located in said arm, said arm being adapted to serve as a reservoir for the liquid of the auxiliary circuit, a sensing wheel mounted on said arm, adapted to be rotated by engagement with its periphery at a speed proportional to the speed of travel and coupled to the auxiliary circuit to control the liquid pressure therein, a hollow support at the other end of the tubular arm on which the sensing wheel is mounted and a pump mounted on the support and adapted to be directly driven by



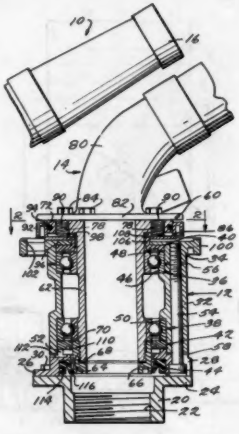
the sensing wheel, the hollow support providing communication between the pump and the reservoir in the arm.

4,193,548

HIGH CAPACITY SPRINKLER HEAD WITH IMPROVED BRAKE MECHANISM

Larry P. Meyer, Walla Walla, Wash., assignor to Nelson Irrigation Corporation, Walla Walla, Wash.

Filed Oct. 18, 1978, Ser. No. 952,608
Int. Cl.[2] B05B *3/02, 3/14*
U.S. Cl. 239—230 **11 Claims**



1. A step-by-step rotary sprinkler head comprising:

a stationary annular housing assembly having a lower portion adapted to be fixedly connected in communicating relation with respect to a source of water under pressure,

an annular mounting member supported within the upper end portion of said stationary annular housing for rotational movement about a generally vertically extending axis generally coextensive with the annular axis of said housing assembly,

said mounting member having a first set of at least three equally annularly spaced threaded stud receiving holes extending vertically therein, a second set of at least three equally annularly spaced stub shaft receiving holes extending vertically therein and a third set of at least three equally annularly spaced coil spring receiving holes extending vertically therein,

an annular brake member having at least three equally annularly spaced stub shafts extending vertically upwardly therefrom and slidably mounted within said second set of holes, said annular brake member having a downwardly facing annular brake surface thereon,

means in the upper portion of said stationary housing assembly providing a fixed upwardly facing annular brake surface disposed in engaged relation with said downwardly facing annular brake surface,

a sprinkler body assembly carried by said mounting member and fixedly secured thereto by bolts extending therethrough and threadedly engaged within said first set of holes,

at least three equally annularly spaced coil springs mounted within said third set of holes having their lower ends engaged with said annular brake member so as to resiliently urge the downwardly facing brake surface thereof into engaged relation with said upwardly facing brake surface with a constant spring force, and

means for communicating said sprinkler body assembly with said stationary housing assembly in fluidtight communicating relation therewith.

4,193,549

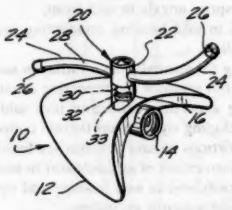
ARM/ROTOR HUB ASSEMBLY

Joseph Gladstone, Teaneck, N.J., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Jul. 24, 1978, Ser. No. 927,103

Int. Cl.[2] B05B *3/06*

U.S. Cl. 239—251 **19 Claims**



1. An arm/rotor hub assembly comprising

A. a hollow rotor adapted to receive a plurality of transversely-extending arms, said rotor having an open end, an opposite end, and a sidewall intermediate said ends, said sidewall defining a like plurality of apertures therethrough;

B. a plurality of hollow arms, each of said arms passing through a corresponding one of said apertures and having one end thereof extending outwardly of said rotor in a generally transverse direction and the other end thereof disposed within said rotor, said other end being flared outwardly to a diameter greater than that of said corresponding aperture and having a portion thereof at least partially disposed intermediate said corresponding aperture and said open rotor end.

4,193,550

CHEMICAL INJECTION HEAD

David L. Juttelstad, Gayville, and Philip Johnson, Vermillion, both of S. Dak., assignors to Dura Corporation, Southfield, Mich.

Filed Sep. 28, 1977, Ser. No. 837,182

Int. Cl.[2] B05B *7/30*

U.S. Cl. 239—314 **1 Claim**

1. A high-pressure liquid injection head for mixing and jetting a stream of liquid carrier and a potentially corrosive liquid chemical as a cleaning compound, said head comprising:

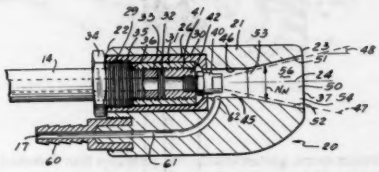
a nozzle body having an input for a relatively inert pressurized liquid carrier and having formed therein:

an outlet channel having rectangular cross-section and having walls diverging in a downstream flow direction and terminating in an outlet through which the mixed compound is discharged in the form of a jet stream,

a cylindrical suction chamber having an upstream termination communicating with said carrier input and having a downstream termination communicating directly with a smallest upstream end of said outlet channel and having a cross-sectional area substantially greater than the area of said aperture,

a liquid chemical inlet passage in communication with the suction chamber at a first point upstream of said aperture with a liquid chemical source;

a nozzle removably mounted in said nozzle body and connected to said carrier input and extending a distance into said suction chamber in axial alignment with said aperture and terminating in said chamber downstream of said first point



said nozzle having diverging interior walls forming a channel diverging at a same angle as said outlet channel, and

said nozzle terminating in said chamber a distance from said aperture such that a jet stream emitted from said spray nozzle directed at said aperture has a cross-section smaller than said aperture when said stream reaches the aperture;

said pressurized jet stream through said suction chamber creating a pressure drop therein to draw said liquid chemical from said chemical source into said suction chamber at said first point for mixing therein with said carrier jet stream, the resulting carrier-chemical mixture being expelled through said outlet channel in the form of a diverging jet stream having substantially no contact with said channel walls, thereby to safeguard the operating components of the spray head against corrosion and to apply the carrier-chemical mixture to an object to be cleaned with high impact scrubbing action.

4,193,551

MANUALLY OPERABLE ATOMIZER

Tadao Saito; Takamitsu Nozawa; Haruo Tsuchida; Shigeo Iizuka, and Takayuki Goto, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1978, Ser. No. 911,353

Claims priority, application Japan, Mar. 16, 1978, 53/33629[U]

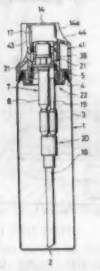
Int. Cl.[2] B05B *9/043*

U.S. Cl. 239—333 **6 Claims**

1. A manually operable atomizer of the type having a container containing a liquid to be atomized, an atomizing means adapted to be held by the neck opening portion of said container, said atomizing means including a pressurizing chamber defined by a cylinder and a piston which are adapted to make a pumping action, an atomizing head through which said piston is depressed and actuated, and a nozzle through which said liquid pressurized in said pressurizing chamber is atomized, comprising:

a connecting member disposed in said neck opening portion of said container and having an inner peripheral wall and an outer peripheral wall connected to each other at their lower ends, said connecting member having a first flange formed at the upper end of said outer peripheral wall and

adapted to rest on the top brim of said neck opening portion, the upper end of said inner peripheral wall constituting an annular supporting surface, said connecting member having a first annular protrusion formed on the outer peripheral surface of said inner peripheral wall of said member, and a second annular protrusion formed on the outer peripheral wall below said first flange for engagement with the inside top rim of the container; a holding member attached to said neck opening portion of said container and having a second flange adapted to face said annular supporting surface of said connecting member, a first cylindrical portion adapted to be fitted to the outer peripheral surface of said inner peripheral wall of said connecting member, and an over cap adapted to cover



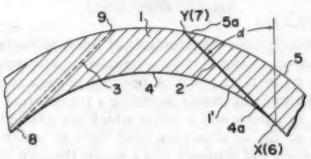
said atomizing head, said over cap having a third annular protrusion formed at its lower end portion and adapted for engagement with a top brim of said neck opening portion, said over cap further having a window formed at its portion corresponding to said nozzle of said atomizing head, said holding member having a fourth annular protrusion formed on said first cylindrical portion of itself for engagement with the first annular protrusion; a third flange extending laterally from the outer periphery of said cylinder and adapted to be cramped between said second flange and said annular supporting surface; and an annular packing adapted to be interposed between said annular supporting surface and said third flange; whereby said atomizing means are stably held, and are easily removed from the container and assembled.

4,193,552

LIQUID SPRAYER PIPE WITH INCLINED SLITS

Ken-ichi Ishikawa, 66-2 Nukatani 2-Chome, Kanazawa, Ishikawa Prefecture, Japan

Filed Aug. 25, 1978, Ser. No. 936,881
Claims priority, application Japan, Nov. 12, 1977, 52-125230
Int. Cl.[2] B05B *1/14, 1/30*
U.S. Cl. 239—533.13 **10 Claims**



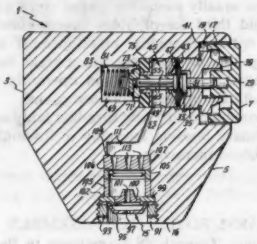
1. A liquid sprayer pipe made of flexible material with a plurality of liquid spraying slits through the wall thereof providing liquid passageways for the passage of liquid flowing through the pipe from an inlet on the inner surface of the wall to an outlet on the outer surface of the wall, said slits being arranged parallel to the direction of liquid flow in said liquid spraying pipe and inclined with respect to said inner and outer surfaces at an angle of up to 45°.

4,193,553

HAND-HELD SHOWER HEAD

Charles M. Kelly, 1016 St. Margarets Dr., and Francis C. Keffer, 1168 Summit Dr., both of Annapolis, Md. 21401

Filed Nov. 7, 1977, Ser. No. 849,213
Int. Cl.[2] B05B *1/18*
U.S. Cl. 239—586 **7 Claims**



1. A hand-held shower head comprising:
(a) a housing to be held in the hand, said housing having a side, a rear and a front,
(b) an inlet positioned in said side,
(c) an outlet spray nozzle in said front,
(d) a passage in said housing connecting said inlet to said spray nozzle,
(e) an opening substantially on a radius in said side,
(f) a push-button actuator reciprocating in said side opening and having a portion extending into said housing, said housing including rigid means therein cooperating with at least two portions on said actuator for limiting the inward reciprocal movement of said actuator in said side opening,
(g) a valve positioned in said passage and operatively connected to said actuator including:
(1) a normally closed movable valve member at least partially biased in the closed position against a valve seat by pressure exerted by water entering through said inlet,
(2) a plunger connected to said movable valve member, and
(3) sealing means cooperating with said plunger.

4,193,554

METHOD AND APPARATUS FOR THE DRYING AND FINE-GRINDING OF COAL

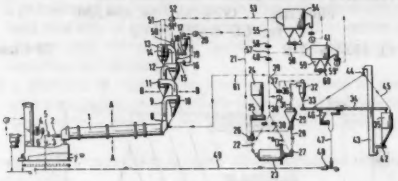
Jakob Ansen, Cologne; Horst Herchenbach, Troisdorf; Helmut Wustner, Cologne, and Heinz Fasbender, Krefeld, all of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Oct. 10, 1978, Ser. No. 949,953
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745424
Int. Cl.[2] B02C *23/00*
U.S. Cl. 241—19 **15 Claims**

1. A method for the drying and pulverizing of coal for the supply of coaldust for the firing of a related installation which supplies a heated, essentially inert, gas bearing mineral dust to the pulverizing apparatus comprising the steps of:
mixing the coal with a part of the inert gas
pulverizing the coal
separating the pulverized coal into dry coaldust and an exhaust gas carrying a residue of coal dust
mixing a part of the exhaust gas with a part of the inert gas

to make the coal dust bearing exhaust gas substantially less combustable

filtering the coal dust from the resultant mixed gas



supplying the filter residue, the coal dust removed from the mixed gas, to the related installation as additional fuel.

4,193,555

ROLL MILL FOR FEEDING MATERIAL TO THE ROLL GAP

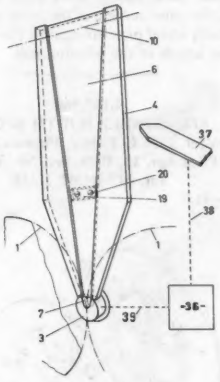
Edgar Ruegger, Arnegg, Switzerland, assignor to Gebruder Buhler AG, Uzwil, Switzerland

Filed Jun. 19, 1978, Ser. No. 917,315

Claims priority, application Switzerland, Jun. 24, 1977, 7766/77

Int. Cl.² B02C *4/02*

U.S. Cl. 241—37 **9 Claims**



1. Roll mill comprising: a paif of rolls forming a roll gap therebetween, a lateral gap seal device at each end of said pair of rolls, each said gap seal device including a sealing pin and a sealing member, means for pressing said gap seal device against said ends, each gap seal device including a flow guide for guiding the flow of material supplied to said roll gap, each said flow guide extending near said roll gap and stopping short of said roll ends outwardly of said roll ends, each said sealing pin sealing said roll gap in the region of the nip of said roll gap and said sealing member being disposed above said pin to define and seal a path of the flow of said material, said sealing member having an elongate recess extending at least approximately at right angles to the axes of said rolls, and said elongate recess being of a depth in the axial direction determined to guide flow of said material to the region of ends of said gap, said pin having a recess formed as a prolongation of said elongate recess and extending near said roll gap, said two recesses communicating with one another and together forming said flow guide, said guide being adapted to guide flow of material into said roll gap in the regions of said roll ends from beyond the ends of said rolls outwardly of said roll ends.

4,193,556

HAMMER MILL

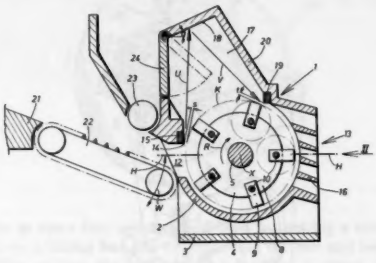
Wilhelm Linnerz, Kaarst, and Egbert Hemscheidt, Mulheim, both of Fed. Rep. of Germany, assignors to Lindemann Maschinenfabrik GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Mar. 9, 1978, Ser. No. 884,848

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1977, 2713177

Int. Cl.² B02C *13/09*

U.S. Cl. 241—186 R **15 Claims**



1. A hammer mill assembly for comminuting scrap material comprising a housing, rotor supported within said housing for rotation about a substantially horizontal axis, hammer means on said rotor for comminuting scrap material in said housing, said hammer means defining during rotation of said rotor a striking circle representing the radially outermost point reached by said hammer means, means defining a scrap material inlet and a scrap material outlet for said housing, and wall means defining a reverberation chamber adjacent the periphery of said rotor, said reverberation chamber being arranged to open inwardly of said rotor and being located with said scrap material outlet arranged immediately forwardly thereof taken in the direction of rotation of the rotor, said reverberation chamber having a forward termination point which is the forwardmost portion of said wall means taken relative to the direction of rotation of said rotor, said forward termination point being spaced a predetermined distance from said striking circle to form a first gap therebetween, said gap being determined in accordance with a degree of comminution of said scrap material desired to be achieved in said hammer mill at said forward termination point, said material inlet being defined with an uppermost termination edge spaced a predetermined second gap from said striking circle of said rotor, said second gap being determined in accordance with a degree of comminution of said scrap material desired to be achieved by said hammer mill at said uppermost termination edge.

4,193,557

STRAND ATTENUATION AND WINDING APPARATUS

Giuseppe-Fabrizio M. Melan, Chambery, and Jean R. Nicouland, Challe-les-Eaux, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Division of Ser. No. 630,925, Nov. 11, 1975, Pat. No. 4,040,572. This application Aug. 5, 1977, Ser. No. 822,208

Claims priority, application France, Nov. 13, 1974, 74 47434

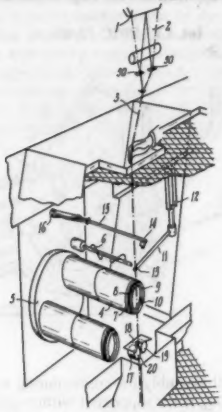
The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.

Int. Cl.³ B65H *54/02*

U.S. Cl. 242—18 A **7 Claims**

1. Apparatus for attenuating and winding continuous strand drawn from a bushing directly onto winding sleeves mountable on and adapted to extend lengthwise over a portion of a rotating collet comprising, a collet mounted for rotation about the longitudinal axis thereof and adapted for receiving a winding sleeve thereon, a face on one end of the collet disposed substantially normally to the axis of rotation of the collet, strand pulling means for drawing the strand from the bushing across

and into engagement with the end face of the collet with portions of the strand extending beyond two points on the periphery of said end face, strand engaging means comprising a multiplicity of angularly displaced strand catching devices associated with said face for engaging portions of the strand



brought into proximity to the face at at least two spaced apart points, means for guiding the strand onto the portion of the collet adjacent said face, and means for shifting the strand axially of the portion of the collet adjacent the face and onto a winding sleeve mounted on the collet after said collet has reached operating speed.

4,193,558

CONTINUOUS WEB SUPPLY APPARATUS

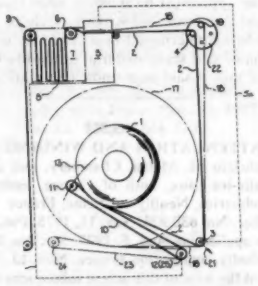
Desmond W. Molins, London, England, assignor to Molins Limited, London, England

Filed Sep. 11, 1978, Ser. No. 941,339

Claims priority, application United Kingdom, Sep. 23, 1977, 39637/77

Int. Cl.[2] **B65H** *19/16*; **B31F** *5/00*

U.S. Cl. 242—58.4 **11 Claims**



1. Apparatus for supplying continuous web to a consuming machine, comprising means for rotating a reel of web to deliver web therefrom, a splicing unit, a buffer reservoir, and a rotary feed device arranged to receive web delivered from the reel and drive the web past the splicing unit into the reservoir, wherein the rotary feed device is arranged to operate at a speed higher than that at which web is delivered from the reel and to exert a non-positive grip on the web so that, whenever the web is stopped, the rotary feed device slips relative to the stationary web.

4,193,559

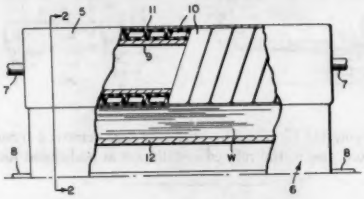
FILM WEB WINDING ASSEMBLY

Raymond M. Ballard, Lancaster, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 7, 1978, Ser. No. 894,550

Int. Cl.[2] **B65H** *17/02*

U.S. Cl. 242—67.1 R **15 Claims**



1. A film web winding assembly consisting essentially of:

(a) a winding roll with

(i) a core and

(ii) a plurality of layers of film web wound thereon,

(b) a layon roll in nip contact with the winding roll, having a constant circumference, and comprising

(i) an incompressible core

(ii) a volumetrically compressible resilient cushion element on the core and

(iii) a flexible, inextensible, outer covering on the cushion element, the outer surface of the outer covering exerting a substantially equal pressure against the winding roll along the entire length of the winding roll.

4,193,560

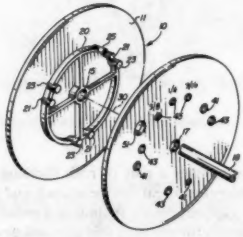
ADJUSTABLE WIDTH SPOOL

Herbert F. Diegel, 1524 E. Culver, Phoenix, Ariz. 85006

Filed Apr. 18, 1979, Ser. No. 31,004

Int. Cl.[2] **B65H** *75/18*

U.S. Cl. 242—71.9 **8 Claims**



1. An adjustable width spool to be rotatably mounted on a shaft for receiving and supporting a roll of flexible material comprising:

a. a first and a second flat plate having opposing flat surfaces and each having a central opening therein for receiving said shaft to rotatably support said plates;

b. said first flat plate having:

i. a spacer ring positioned concentrically to said shaft and extending a first predetermined distance perpendicularly from the opposing surface of said first flat plate toward the opposing surface of said second flat plate for receiving and supporting said roll of flexible material;

ii. a plurality of spacer pins extending a second predetermined distance greater than said first predetermined distance perpendicularly from its opposing surface toward the opposing surface of said second flat plate;

iii. a registration pin extending a distance greater than said

predetermined distances perpendicularly from its opposing surface toward the opposing surface of said second flat plate;

c. said second flat plate having:

i. a plurality of spacer openings corresponding in number to said plurality of spacer pins and positioned to permit said pins to pass through said openings when said pins and openings are aligned;

ii. a plurality of registration openings positioned to permit said registration pin to pass through any of said openings when said registration pin and a registration opening are aligned;

d. said plates positionable in either of two positions relative to each other:

i. the first position defined by abutting contact between said spacer ring and the opposing surface of said second flat plate, by the extension of said spacer pins into said spacer openings, and by the extension of said registration pin into one of said registration openings;

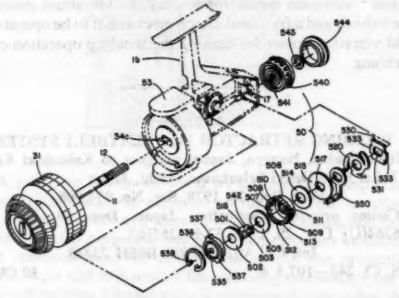
ii. the second position defined by abutting contact between said plurality of spacer pins and the opposing surface of said second flat plate, and by the extension of said registration pin into a different one of said registration openings.

4,193,561

CLICKER DEVICE FOR FISHING REEL

Roy E. Stiner, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 10, 1978, Ser. No. 932,463
Int. Cl.[2] A01K *89/02*
U.S. Cl. 242—84.51 A **5 Claims**



1. In an open face sprinning reel used for casting a bait attached to a fishing line and for retrieving the bait and fishing line after casting, the reel having a housing, a center shaft mounted in the housing, a spool mounted on the shaft for holding the fishing line, a handle and gear train assembly mounted in the housing, a rotor coaxially mounted on the shaft and rotatable by cooperative movement of the handle and assembly, and a movable bail mounted on the rotor having an open casting position and a closed retrieving position, limited rotation of the spool being desirable when retrieving the bait with the fish caught thereon, a free-floating drag assembly having a cup mounted on a drag adjustment screw,

an improved click signal device for indicating when the spool is rotating comprising:

(a) a serrated tooth-shaped exterior surface on the cup, and

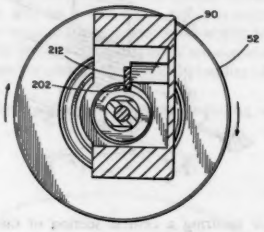
(b) a clicker mounted on the screw and comprising a washer base with an L-shaped arm, one leg of the L secured to the washer and extending radially therefrom, the second leg projecting longitudinally such that the free end is in operable contact with the serrated tooth-shaped surface, whereby the arm vibrates making a clicking sound when the cup rotates.

4,193,562

ANTI-REVERSE DEVICE FOR FISHING REEL

Richard L. Gifford, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 11, 1978, Ser. No. 932,844
Int. Cl.[2] A01K *89/01*
U.S. Cl. 242—84.2 G **11 Claims**



1. In an open face spinning reel used for casting a bait attached to a fishing line and for retrieving the bait and fishing line after casting, the reel having a housing, a center shaft mounted in the housing, a spool mounted on the shaft for holding the fishing line, a pinion gear assembly rotatably journaled near the center and in the forward portion of the housing, the pinion gear assembly coaxial with the center shaft and having a bearing stud at one end and a threaded portion at the other end, a handle and gear train assembly mounted on the housing and operable with the pinion assembly, a rotor mounted on the threaded portion of the pinion assembly and rotatable by cooperative movement of the handle and gear train and pinion assembly, and a moveable bail mounted on the rotor having an open casting position and a closed retrieving position, preselected stopped counterclockwise rotation of the rotor provides a self-centering rotor position for opening the bail mechanism comprising;

(a) a ratchet mounted on the central portion of the pinion gear assembly and rotatable therewith,

(b) an arm pivotably mounted in the housing, the arm having a rearward end and a forward pawl end, the pawl end in operable association with the ratchet and adjacent thereto, and

(c) means for assisting the movement of the rearward end of the arm to an upper or lower position which in turn moves the pawl in an opposite lower or upper position, in the lower position the pawl end engagable with the ratchet:

(1) to prevent the rotation of the rotor in a counterclockwise direction when the reel is viewed from the spool, and

(2) to provide location of the bail in the most advantageous position for pivoting to the casting position,

and with the pawl end in the upper position the rotor is free to rotate counterclockwise.

4,193,563

APPARATUS FOR CARRYING AND DISPENSING CABLE

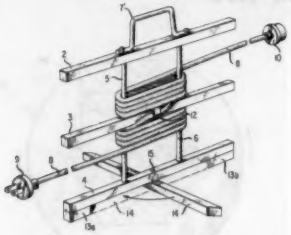
Carmen Vitale, 86 Montgomery St., Bloomfield, N.J. 07003

Filed Dec. 1, 1977, Ser. No. 856,340
Int. Cl.[2] B65H *39/00*
U.S. Cl. 242—85 **5 Claims**

1. A frame for storing and dispensing electrical cable or the like which comprises in combination:

a grid of electrically insulated material formed by three substantially colinear bars rigidly fixed in substantially parallel equally spaced-apart relation by a pair of transverse parallel rungs symmetrically disposed in spaced-apart relation between opposite ends of said bars, thereby forming between them when said frame is in an upright position an upper section and a lower section each form-

ing a discrete winding area, each of which includes a central portion between opposite open ends, said upper section and said lower section each constructed to serve as a spool for separately winding opposite ends of said cable from the central section outward, and



means for securing a central section of said cable to the central portion of the middle one of said three colinear bars, whereby the cable on one side of the secured central section of said cable is capable of being wound on one of said discrete areas and the cable on the other side of the secured central section of said cable is capable of being wound on the other of said discrete areas.

4,193,564

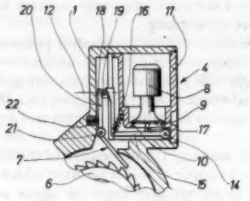
LOCKING DEVICE IN CONNECTION WITH SAFETY BELTS

Stig M. Lindblad, Stockabo, S-44020 Vargarda, Sweden

Filed May 8, 1978, Ser. No. 903,654

Int. Cl.[2] **A62B** *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **5 Claims**



1. A locking device for a safety belt retractor for use in vehicles and comprising a band reel rotatably journalled in a housing, a band connected with one end to the band reel, spring means arranged to wind up the band on the band reel, a ratchet wheel rotatable together with the band reel, a pawl arranged to be movable between a releasing position and a locking position to release and lock the ratchet wheel, respectively, activating means comprising a body of inertia, arranged to move between an inactive position and an activated position, and a transmission mechanism connected to the body of inertia and to the pawl, a housing portion for supporting the body of inertia and the transmission mechanism, said housing portion being mounted in said housing in one chosen position among different alternative angular positions relative to a pivot axis extending transversely to the rotating axis of the band reel, the transmission mechanism including a transmission element which is pivotally journalled in the housing portion and provided with a guiding surface which is inclined relative to a radial plane through said pivot axis of the housing portion and provided with a contact surface by means of which the guiding surface is in contact with a portion of the pawl, said portion of the pawl being movable in the direction of said pivot axis thereby moving the pawl, the transmission element being movable between two positions under the influence of the body of inertia with the guiding surface movable substantially transversely to said pivot axis, whereby said contact surface moves along said guiding surface and said portion of the pawl is displaced substantially in the direction of the pivot axis resulting in said pawl being moved between locked and released positions respectively.

4,193,565

SEATBELT RETRACTOR

Keiichi Tamura, Nagoya, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Nov. 14, 1978, Ser. No. 960,596

Claims priority, application Japan, Nov. 16, 1977, 52-154748[U]

Int. Cl.[2] **A62B** *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **5 Claims**

1. A seatbelt retractor wherein the wind-out operation of a webbing to be wound by a take-up shaft which is locked through the operation of an acceleration sensor in an emergency of a vehicle, characterized in that said retractor comprises a vibration sensor for sensing the vibrations caused to the vehicle and a frictional clutch mechanism to be operated by said vibration sensor for braking the wind-up operation of the webbing.

4,193,566

WEBBING RETRACTOR FOR SEATBELT SYSTEM

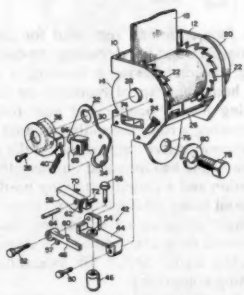
Mitsuo Inukai, Nagoya, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Dec. 28, 1978, Ser. No. 974,008

Claims priority, application Japan, Dec. 29, 1977, 52-176264[U]; Dec. 29, 1977, 52-176265[U]

Int. Cl.[2] **A62B** *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **10 Claims**



1. A seatbelt system comprising:

a takeup shaft pivotally supported by a frame for winding up a webbing for restraining an occupant;

a ratchet wheel solidly secured to said takeup shaft;

a lock bar supported by said frame and engaging said ratchet wheel when oscillated, to thereby prevent the takeup shaft from being wound out;

a working plate pivotally supported by the frame and oscillating said lock bar when oscillated;

an acceleration detector;

a balancer mounted on said acceleration detector and having a pair of pawls extending longitudinally in parallel to the axis of said ratchet wheel, said pair of pawls being adapted to engage said ratchet wheel in response to the detection by said acceleration detector of acceleration; and

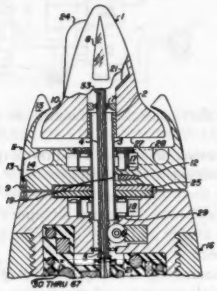
guide means mounted on said working plate for guiding said pair of pawls in the direction of being engaged with said ratchet wheel to thereby impart the turning force of the ratchet wheel, which is received by said pawls, to said working plate to provide an oscillating force to cause said lock bar to engage said ratchet wheel to thereby prevent said takeup shaft from being wound out.

4,193,567

GUIDANCE DEVICES

Lewis C. McCarty, Jr., Scarborough-on-Hudson, N.Y., assignor to Novatronics, Inc., Pompano Beach, Fla.

Filed Jul. 17, 1962, Ser. No. 210,443
Int. Cl.[2] F42B *15/18*
U.S. Cl. 244—3.16 **12 Claims**



1. A guidance system mounted on a projectile comprising first and second sections mounted on the projectile to rotate about the longitudinal axis thereof, means for rotating said first section when the projectile is in flight, sensor means including a part removed from the longitudinal axis of the projectile rotatable with said first section for receiving emanation from a target and emitting a signal pulse in response thereto when the said part is facing the target and the longitudinal axis of the projectile and the target lie in a straight line, means including said second section for applying a steering force to the projectile at a point rotatable with said second section and directed perpendicularly to the longitudinal axis of the missile, means for rotating said second section when the projectile is in flight, means for generating a position pulse when said first and second sections are in such relation that the steering force tends to steer the missile in the direction in which said part is facing and means responsive to coincidence of said signal and position pulses for deactivating said means for rotating said second section.

4,193,568

DISC-TYPE AIRBORNE VEHICLE AND RADIAL FLOW GAS TURBINE ENGINE USED THEREIN

Norman L. Heuvel, 14723 SE. 263rd, Kent, Wash. 98031

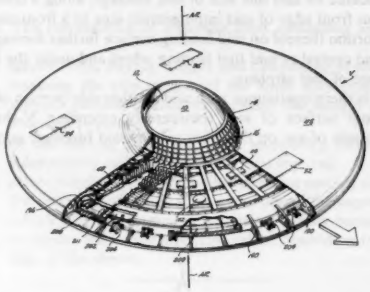
Continuation-in-part of Ser. No. 702,523, Jul. 6, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,673
Int. Cl.[2] B64C *29/04*; F02C *3/14*
U.S. Cl. 244—23 C **27 Claims**

1. In a disc type airborne vehicle having a central section including a cockpit area, jet engine means annularly surrounding said cockpit area, and thrust ducting means in a duct section annularly surrounding said jet engine means, the improvement wherein said jet engine means is characterized by:

(a) an annular compressor section having decreasing side wall members in the radial dimension wherein air is compressed under action of a plurality of counter-rotating compressor blades and delivered to an annular diffuser zone;

(b) air intake means of a radial length at least about one-third the radial length of said engine, disposed within said central section, said air intake means being in constant communication with said compressor section and delivering a supply of air thereto, said supply of air continuously impinging upon the entire width of said plurality of compressor blades;

(c) an annular combustion chamber including upper and



lower counter-rotating combustion chamber walls having air delivery openings therein, with said annular diffuser zone delivering compressed air directly into said combustion chamber and around said counter-rotating combustion chamber walls and into said combustion chamber through said air delivery openings in said counter-rotating combustion chamber walls;

(d) means for continuously delivering fuel directly into said combustion chamber for admixture therein with the compressed air delivered thereto from said compressor section annular diffuser zone;

(e) an annular turbine section wherein counter-rotating turbine blades are driven by combustion products exhausting in radial flow from said combustion chamber; and

(f) means delivering the exhaust gases discharging from said turbine section to said duct section.

4,193,569

PROCESS AND APPARATUSES FOR LANDING AIRCRAFT ON WATER COVERED LANDING SURFACES

William B. Nichols, Apt. #102, 2700 SW. 16th, Amarillo, Tex. 79102

Continuation of Ser. No. 657,557, Feb. 12, 1976, abandoned. This application Sep. 19, 1977, Ser. No. 834,646
Int. Cl.[2] B61D *47/00*; B64D *33/04*
U.S. Cl. 244—100 R **9 Claims**

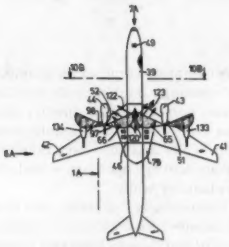
1. Process of landing an airplane with landing wheels on a solid landing surface covered with a layer of water while passing all of the exhaust gases from two engines of the airplane, each of said two engines located laterally of the fuselage of said airplane with one of said engines in each side of said fuselage, and moving the center of said airplane in a first, longitudinal direction, said process comprising the steps of

(1) passing all said exhaust gases directly from said two engines to impinge upon said landing surface at an impingement area extending transversely to said first longitudinal direction, and forming and maintaining a first side portion of a transversely extending and forwardly pointed V-shaped curtain of gas with a front surface that, on one

side of said fuselage, extends upwardly from one side of said impingement area on said landing surface to an engine on said one side of said fuselage, said one side of said impingement area being spaced transversely from said one engine and, on the other side of said fuselage, another side portion of said transversely extending V-shaped curtain of gas having a front surface which extends upwardly from another side of said impingement area on said landing surface to a second of said engines on said other side of said fuselage and said other side of said impingement area being spaced transversely from said second engine and,

on said one side of said fuselage said front surface of said one side portion of said transversely extending curtain of gas extends centrally and forwardly, from a lateral edge of said impingement area located to the front of and outboard of a first one of said landing wheels of said airplane located on said one side of said fuselage, along a continuous front edge of said impingement area to a front central portion thereof on said landing surface further forward of and central of said first landing wheel and under the fuselage of said airplane,

and is there continuous with said another side portion of the front surface of said transversely extending V-shaped curtain of gas on the other side of said fuselage, said another side portion of said front surface of said transversely extending curtain of gas extends forwardly and centrally from a lateral edge of said impingement area located to the front and outboard of a second one of said landing wheels of said airplane located on said other side of said fuselage, along a continuous front edge of said impingement area to a front central area portion thereof on said landing surface further forward of and central of said second landing wheel and under the fuselage of said airplane,



said impingement area having, on each side of the fuselage of the airplane, a rear inboard edge which has an outboard portion that is spaced forward of said landing wheel on each side of said fuselage and a central portion located inboard of said landing wheels,

(2) displacing the water of said layer of water, by said curtain of gas, from a longitudinally extending path of said wheels and forming a dry surface behind said rear edge of said impingement area of said gas curtain while moving said airplane and gas curtain forward at a sufficiently high rate of speed to maintain said landing wheels in direct contact with said solid landing surface and passing laterally from the lateral edges of said gas curtain, at points lateral of each of said first and second landing wheels, water from said layer of water theretofore in advance of said gas curtain on said solid landing surface.

4,193,570

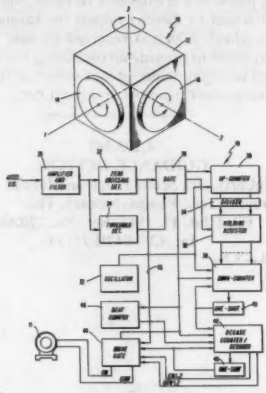
ACTIVE NUTATION CONTROLLER

Henry C. Hoffman, Baltimore, and James H. Donohue, Ellicott City, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 19, 1978, Ser. No. 897,830

Int. Cl.[2] B64G *1/20*

U.S. Cl. 244—165 **5 Claims**



1. A system for controlling nutation in a spinning body, comprising:

a flywheel having an axis of rotation perpendicular to the nominal spin axis of said body;

motor means for rotating said flywheel;

an angular accelerometer having an input axis perpendicular to the spin axis of said body and to the axis of rotation of said flywheel;

means for monitoring an output signal generated by said angular accelerometer, said monitoring means including;

means for generating an accelerometer threshold voltage, and

means for comparing said accelerometer output signal with said threshold voltage;

means for detecting zero crossover points of said accelerometer output signal;

means for detecting predetermined portions of positive and negative half cycles of said accelerometer output signal, said predetermined detecting means and said zero crossover points detecting means being operative only when said comparing means indicates that said accelerometer output signal is greater than said threshold voltage; and

means responsive to said last two means for controlling said motor means to selectively damp or build nutation.

4,193,571

SUSPENSION SYSTEM

Karl Bula, Seuzach, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 26, 1977, Ser. No. 845,783

Claims priority, application Switzerland, Oct. 28, 1976, 13585/76

Int. Cl.[2] B42F *13/00*

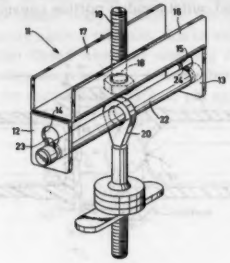
U.S. Cl. 248—343 **12 Claims**

1. A suspension system comprising

a one part holder adapted to be fixed to one of a wall and a ceiling, said holder having at least two apertures therein disposed in opposition to each other; each said aperture having a constricted section and a widened section above said constricted section; and

a support bar having a widened portion sized to pass longitu-

dinally through a widened section of one of said apertures and a constricted portion sized to fit transversely into said



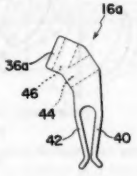
constricted section of said one aperture to lock said support member in said holder.

4,193,572

HOLDER FOR HOLDING TEMPERATURE DETECTING DEVICE EMPLOYED IN MICROWAVE OVENS

Masao Horiuchi, Tenri, and Yasuyuki Motozuka, Kashiwara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 6, 1977, Ser. No. 794,653
Claims priority, application Japan, May 12, 1976, 51/54635
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—535 **11 Claims**



1. A probe holder for firmly holding a probe on a container supporting an item being cooked in a microwave oven, said holder comprising:

a body portion formed of a material having a low dielectric loss;

arm member means, formed of the same material as said body portion and extending from an upper end thereof, said arm member means comprising at least two arm members resiliently urged toward each other, said two arm members having formed therein a plurality of pairs of opposed, facing recesses, said pairs of recesses being formed in said arm members to extend at different angles; and

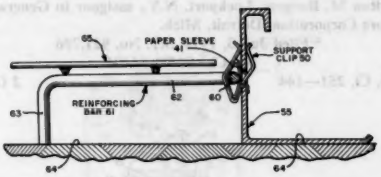
leg member means, extending from a lower second end of said body portion opposite said arm members, for securely fitting said body portion and said arm members to a container, said leg member means comprising at least two leg members resiliently urged toward each other and adapted to be fitted on opposite sides of the container to thereby be urged toward the container.

4,193,573

CLIP-AND-SLEEVE ARRANGEMENT FOR USE WITH PAVING FORM AND TIE BAR

Walter F. Kinnucan, Jr., 140 Blackstone, LaGrange, Ill. 60525

Filed Jul. 25, 1978, Ser. No. 927,891
Int. Cl.[2] E01C *19/50*
U.S. Cl. 249—9 **12 Claims**



1. The combination of a paving form containing apertures and:

a support clip, having hanger and restraining portions for retaining the clip in one of the form apertures, and a support portion connected between the hanger and restraining portions;

a tie bar, having a first leg and a second leg extending at substantially right angles to the first leg; and

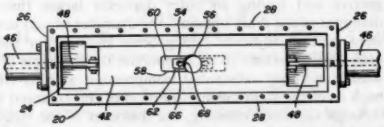
a protective sleeve, substantially enclosing one leg of the tie bar and received in the support portion of the support clip, which sleeve is formed of a material readily broken open to expose the tie bar after concrete is poured on the other side of the sleeve.

4,193,574

WELL SHUT OFF DEVICE

Johney H. Barnes, and Lucynda D. Barnes, both of 1463 Hartnell, Space 25, Redding, Calif. 96001

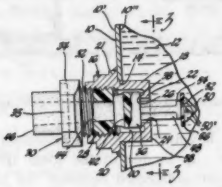
Filed Oct. 27, 1978, Ser. No. 955,170
Int. Cl.[2] E21B *33/06;* F16K *3/00*
U.S. Cl. 251—1 A **2 Claims**



1. A well shutoff device including a hollow closed casing having vertically spaced upper and lower walls provided with vertically registered passages formed therethrough relative to which axially spaced lower ar.d upper ends of vertically spaced well casing sections may be sealingly secured, a pair of vertically superposed control plates slidingly mounted within the housing between the upper and lower walls thereof for inverse shifting toward and away from one pair of opposite side walls of the casing between a second pair of opposite casing side walls, each of said plates having a keyhole opening formed therethrough, said openings facing in opposite directions and including large diameter partial cylindrical first ends and small diameter partial cylindrical second ends opening into the first ends, said plates being shiftable relative to each other and said housing between first positions with said second ends of said keyhole openings registered in a complementary manner to form a small diameter bore registered and coaxial with said passages, second positions with said first ends registered in a complementary manner to form a large diameter bore registered with and coaxial with said passages and third positions with said openings completely out of registry with each other and said openings and said passages closed by said control plates, said upper wall of said housing being removably secured to the remainder of said housing, said keyhole opening second ends being defined by replaceable inserts removably

received in smaller dimensioned ends of said openings, said inserts each being constructed of slightly deformable and resilient material and defining a restrictive neck passage communicating the corresponding keyhole first and second ends.

4,193,575
RADIATOR DRAIN ASSEMBLY
Carlton M. Burgess, Lockport, N.Y., assignor to General Motors Corporation, Detroit, Mich.
Filed Jul. 3, 1978, Ser. No. 921,796
Int. Cl.[2] B65D *41/04*
U.S. Cl. 251—144 **2 Claims**



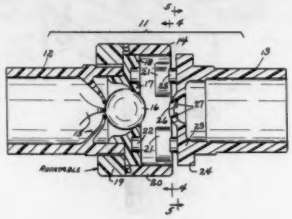
1. In a drain closure of the type having an internally threaded support body with a drain opening therein which is adapted to be attached in the wall of a liquid container, an elongated valve member with an externally threaded portion engaged with the threaded portion of the support body and having an internal flow passage therein, an improved retention means comprising:

a stem portion integral with the valve member and configured to permit its extension through said drain opening and including an intermediate portion thereof configured in association with the drain opening to allow fluid flow between the stem and the support body;

an end of said stem portion having an enlarged head portion with a diameter providing a close fit through said drain opening and a small diameter portion inward therefrom having a circumferential groove adjacent to the head portion, an elastomeric washer member seated in said groove and having an outer diameter larger than the diameter of the drain opening, the diameter of said inward stem portion adjacent said groove and washer therein providing clearance to accommodate the thickness of said washer without substantial compression as it is folded back over the stem during insertion of the enlarged head through the drain opening, the diameter of the enlarged head being slightly smaller than said drain passage but sufficient to prevent withdrawal of the elastomeric washer without substantial compression of the washer material against the enlarged head portion thereby preventing easy and inadvertent removal of the valve without a significant removal force.

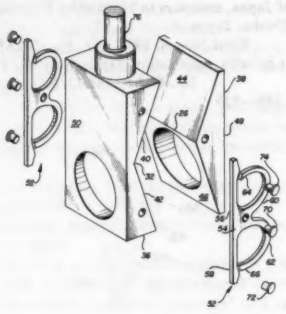
4,193,576
SELF-FLUSHING BALL SEAL DISCONNECT
Jack E. White, Carson City, Nev., assignor to J & D Enterprises, Carson City, Nev.
Continuation-in-part of Ser. No. 865,923, Dec. 30, 1977. This application Oct. 31, 1978, Ser. No. 956,982
Int. Cl.[2] F16L *37/28*
U.S. Cl. 251—149.6 **23 Claims**

1. A self-flushing disconnect coupling assembly for liquid flow systems comprising: an inlet conduit portion adapted to be connected to a liquid supply line; a valve seat on said inlet conduit portion; a movable valve element in said inlet conduit portion sealingly engageable with said seat; spring means in the inlet conduit portion bearing on said valve element and urging it toward said seat, said spring means being integral and unitary with said inlet conduit; an outlet conduit portion; means to detachably couple said outlet conduit portion to said inlet conduit portion, said coupling means including mating means on said inlet and outlet conduit portions; and means to allow flushing of the conduit portions including the mating means during uncoupling and re-coupling, comprising an unseating projection on said outlet conduit portion engageable with said



valve element to unseat it responsive to the coupling of said outlet conduit portion whereby said unseating projection unseats said valve element to allow escape of liquid thereby providing flushing of the conduit portions and mating means during uncoupling and re-coupling.

4,193,577
EXPANDING GATE VALVE WITH AXIALLY FLEXED SPRING PLATE
Willard E. Kemp, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.
Filed Oct. 10, 1978, Ser. No. 949,844
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—167 **10 Claims**



1. In a gate valve of the type wherein a gate assembly is linearly reciprocable between open and closed positions at the ends of its strokes and in each such end position is transversely expandable to seal a pair of opposed seats of a fluid passageway interrupted by a valve operating chamber in which such gate assembly is disposed and operates, such gate assembly consisting of a gate member and a segment member which nest together to form a rectangular block having opposed and parallel outside sealing surfaces facing said opposed seats, the gate and segment members having interfacing complementary inner wedging surfaces effectively operable upon a relative displacement between such members in the direction of travel of the assembly to expand the assembly against the seats,

the improvement comprising a spring plate secured to one of the side surfaces of said gate and segment members, said spring plate having a central body portion rigidly secured to the segment member at its midlength, an elongated base member extending in both directions from the bottom of said center body portion and passing under a pair of opposed pins secured to said gate member and disposed at equal distances from its midlength point, and a pair of curved spring fingers extending in opposite lengthwise

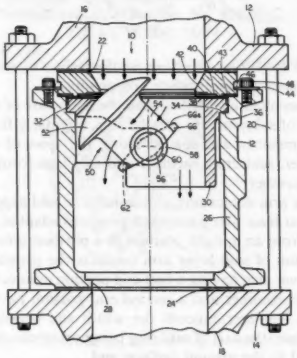
directions from the top of said center body portion and curving toward said pair of pins in the gate member and terminating in free ends, said free ends being flexed toward the center body portion of the spring plate and held in flexure against said pins, one of said spring fingers being further flexed when the wedging expansion of the gate assembly decreases the spacing between said mid-length of the segment and the gate pin against which said finger is initially flexed.

4,193,578

LOW TORQUE CONTROL VALVE

Richard S. Brumm, Orinda, Calif., assignor to Cashco, Incorporated, Ellsworth, Kans.

Filed Nov. 14, 1977, Ser. No. 851,500
Int. Cl.² F16K *1/18*
U.S. Cl. 251—283 **6 Claims**



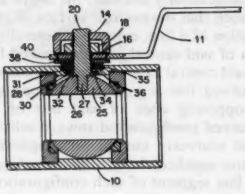
1. A rotary valve comprising:
a housing;
means in said housing forming an upstream flow passagewas;
a plug, circular in outline and having an upstream surface thereon extending across said passageway when in a maximum blocking position;
sealing portions of said upstream surface being spherical;
shaft means carried on said plug and rotatably mounted in said housing for turning said plug between said maximum blocking position and a full open position 90 degrees therefrom;
said upstream surface being displaced from the axis of said shaft means so that a flow stream through said housing impinging thereon will bias said plug away toward said full open position through the full movement in any position thereof away from said maximum blocking position;
a pair of arms extending generally radially from said shaft means supporting said plug; and
a vane extending between said arms to be exposed to a flow stream through said housing;
said vane being tilted about an axis parallel to the axis of said shaft means in the direction opposite to plug opening movement so that impingement of said flow stream thereon biases said plug away from said full open position in any position of said plug away from said maximum blocking position.

4,193,579

DETACHABLE HANDLE FOR CONTROL DEVICES

Roger G. Massey, Exeter, N.H., assignor to Parker & Harper Mfg. Co., Inc., Worcester, Mass.

Filed Nov. 8, 1977, Ser. No. 849,678
Int. Cl.² F16K *31/60*
U.S. Cl. 251—288 **3 Claims**



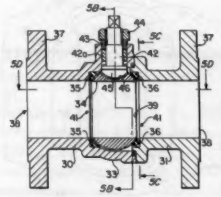
1. A valve assembly with a detachable handle comprising:
(a) A valve body;
(b) a valve stem that extends inside said valve body and is secured in place by a first nut screwed onto said stem at the exterior of said valve body;
(c) an indexing member positioned over said stem under said nut, said indexing member having a depending tab mating with indexing stops in said valve body;
(d) a detachable handle mating with the periphery of said indexing member in a single position relative to said indexing member by means of an aperture and a slot extending from said aperture to accomodate said depending tab; and,
(e) a second nut with skirts extending past the periphery of said first nut so as to secure said handle in place while enveloping said first nut, whereby said first nut secures said stem and said indexing member in place independently of said handle and said second nut permits said handle to be secured or detached independently of said indexing member.

4,193,580

PLUG VALVE

Lewis H. Norris, Brighton, and Charles H. Dykes, Lindfield, both of England, assignors to Worchester Controls AG, Zug, Switzerland

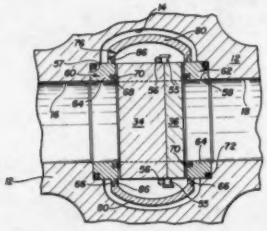
Filed Apr. 1, 1977, Ser. No. 783,899
Claims priority, application United Kingdom, Apr. 6, 1976, 13847/76
Int. Cl.² F16K *5/00*
U.S. Cl. 251—309 **53 Claims**



1. In a plug valve of the type comprising a casing adapted to be connected to a pipe line and having a valve chamber and inlet and outlet openings for defining a fluid flow path through said chamber, a plug being mounted in said chamber and having a fluid flow passageway extending through said plug, said plug being rotatable in said chamber about an axis of rotation extending transverse to said fluid flow path and transverse to the direction of extension of said passageway for selectively moving said plug between an open position in which said passageway is disposed along said fluid flow path between said inlet and outlet openings and a closed position in which said

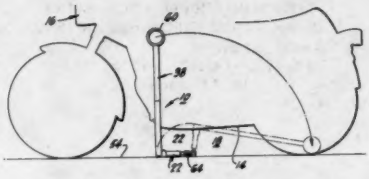
passageway is disposed transverse to said flow path, seal means being provided adjacent at least one side of said plug for providing a fluid seal between said casing and an exterior surface portion of said plug located between the opposing ends of said passageway when said plug is in its said closed position, the improvement wherein said plug is of elongated configuration extending along a central axis transverse to said fluid flow path, said central axis being the axis of rotation of said plug, every section of said plug orthogonal to said central axis of said plug being substantially circular, the shape of said elongated plug being such that the exterior surface of said plug is generated by rotation of a line, extending generally in the direction of extension of said central axis and spaced from said central axis, about said central axis wherein said line of generation has convexly curved line segments at its opposing ends which direct the opposing ends of said line of generation in a smoothly curved configuration toward said central axis and wherein said convexly curved line segments are interconnected to one another along said line of generation by an intervening line segment of such configuration that the entire line of generation, constituting said convexly curved line segments and said intervening line segment, is noncircular and the overall length of said plug is greater than the sum of the radii of said convexly curved line segments, the cross-sectional shape of said passageway in planes transverse to the direction of extension of said passageway through said plug being elongated in the direction of elongation of said plug, said seal means being supported by said casing in surrounding relation to one of said openings, said seal means comprising a single continuous resilient seat of elongated closed loop configuration, the direction of elongation of said closed loop seat configuration extending generally in the same direction as the central axis of said plug, said seat being shaped and dimensioned to engage and conform to said exterior surface portion of said plug along a continuous noncircular band of discrete width shaped to define curved sections at the opposing ends of said band which extend over the end portions of the plug defined by said convexly curved line segments and merge smoothly into intervening band sections having shapes different from those of said curved end sections of said band.

4,193,581
CAGE FOR GATE VALVES AND METHOD OF ASSEMBLY
Barney A. Eilers, Missouri City, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.
Filed Jun. 19, 1978, Ser. No. 917,037
Int. Cl.[2] F16K 3/00
U.S. Cl. 251—328 **4 Claims**



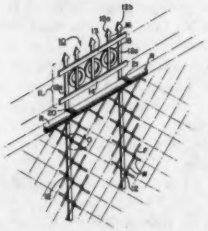
1. A gate valve structure comprising:
a valve body having a valve chamber therein and axially aligned inlet and outlet flow passages communicating with the valve chamber;
a bonnet connected to an upper end of the valve body;
an open-ended cage received within the valve chamber, said cage having a pair of generally parallel sides spaced by ends extending between the sides, said sides each having an opening therein in alignment with said flow passages;
an expanding gate assembly mounted within the cage closely adjacent the generally parallel sides for movement between open and closed positions relative to the flow passages;
and an annular seat within each opening around the adjacent flow passage and having a face seal for sealing against the gate assembly, said seats being mounted for limited longitudinal movement relative to the cage, said cage having means to stop the inward movement of the seats to maintain a predetermined minimum clearance between the seats.

4,193,582
JACK FOR LIFTING OBJECTS
Roger P. Neilsen, 2943 Hillegass, Berkeley, Calif. 94705
Filed Jul. 19, 1978, Ser. No. 925,950
Int. Cl.[2] B66F 7/22
U.S. Cl. 254—131 **12 Claims**



1. A jack for lifting an object particularly a motorcycle and the like from a ground surface comprising:
a. cross member adapted to span the underside of the object;
b. a pair of substantially parallel legs, angularly fixed to said cross member and spaced along the span of said cross member, said cross member and said legs forming a support member;
c. a lever arm detachably connectable to said support member in at least two juxtaposed positions adapted for movement from an upright position to a position where at least a portion of said lever arm contacts the ground surface, said lever arm having a first end portion connected to said support member and a second end portion having a ring whose diameter exceeds the width and breadth of said lever arm, the axis of said ring being oriented substantially parallel to the ground surface; and
d. means for utilizing the weight of the object being lifted to urge said contact of said at least a portion of said lever arm with the ground surface.

4,193,583
CHAIN LINK FENCE EXTENSION
Russell L. Witt, P.O. Box 94044, Houston, Tex. 77018
Filed Jan. 11, 1979, Ser. No. 2,634
Int. Cl.[2] E04H 17/00
U.S. Cl. 256—11 **6 Claims**



1. An extension to be applied to the top of a chain link type

of fence for raising its height, the fence including a fabric of wires interlinked in zig-zag configuration and defining multiple adjacent vertical openings extending through the links between the wires, the extension comprising:

a panel portion to be located in a vertical plane above the chain link fabric to extend the height of the fence thereabove;

a mounting leg portion extending downwardly from the panel portion parallel to said vertical plane and comprising vertically elongated leg means having opposed front and rear surfaces and opposed side surfaces mutually spaced to slide into and snugly fit within vertical openings of the fabric and be supported thereby;

abutment means fixed to and extending transversely from the leg means adjacent to the panel portion and disposed to overlie the top of the fence and prevent further downward sliding of the leg means in the openings of the fabric; and

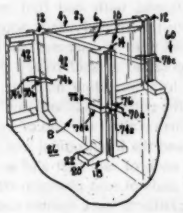
some of said leg surfaces having detent means shaped to slide downwardly past the zig-zag fabric wires defining the openings when the leg means are inserted therein, but said detent means being operative to resist upward withdrawal of the leg means from the fabric.

4,193,584

LIVESTOCK FENCE

Joseph H. Wieser, Maiden Rock, Wis., assignor to Wieser's Concrete Products, Inc., Maiden Rock, Wis.

Filed Aug. 2, 1978, Ser. No. 930,405
Int. Cl.² E04H *17/14*
U.S. Cl. 256—19 **10 Claims**



1. An improved fence for containing livestock, which comprises:

(a) a plurality of spaced pre-cast concrete posts, wherein each post includes an enlarged base of sufficient size such that the posts are suited to be free-standing on top of the ground;

(b) a plurality of pre-cast concrete panels, wherein each panel is suited to be received between any two adjacent posts;

(c) means for confining each panel between the two adjacent posts such that the panel is held against lateral movement and the weight of the panel is not transferred to the posts but is substantially borne by the ground; and

(d) means for securing each of the panels against longitudinal movement relative to the posts such that the panels are held confined between the posts to maintain the integrity of the fence, wherein the securing means comprises a strap loosely surrounding each post and having the ends thereof affixed to a face of the panels adjacent the posts.

4,193,585

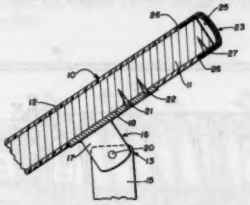
HANDRAIL ASSEMBLY FOR CURVED STAIRCASE

Roger Eandi, 4201 Bemis, Oakland, Calif. 94605

Filed Nov. 14, 1977, Ser. No. 850,925
Int. Cl.² E04H *17/14*; E06C *7/18*
U.S. Cl. 256—65 **13 Claims**

1. A handrail assembly for a curved staircase comprising a plurality of baluster means having support means to support a cylindrical handrail and means to accept a connector, and having means to fix said baluster means at a predetermined height above said staircase,

a stranded cylindrical aluminum cable coated with flexible



plastic material, said coated cable having an outside diameter at least 0.75 inches, and

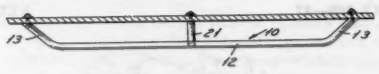
said cable being fastened to each of said support means with a connector.

4,193,586

HAND RAIL

Torbett B. Guenther, Plymouth, Mich., assignor to C. D. Sparling Company, Plymouth, Mich.

Continuation-in-part of Ser. No. 654,183, Feb. 2, 1976. This application Nov. 30, 1977, Ser. No. 855,882
Int. Cl.² E04F *11/18*
U.S. Cl. 256—69 **32 Claims**



1. In a hand rail, the combination comprising

a wall,

a hand rail comprising a length of tubular material including a central portion and end portions extending from said central portion at an obtuse angle,

said end portions having free ends defining a plane which is at an acute angle to the plane of said central portion and end portions,

said ends of said end portions engaging said wall,

means for fastening said rail to said wall at said ends of said end portions comprising an insert in each end portion,

a fastener extending therefrom through said wall,

said insert being molded in situ, said fastener extending through an opening in said end portions into said wall.

4,193,587

RECOIL SPRING ASSEMBLY

Lawrence R. Cline, Oswego, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 23, 1978, Ser. No. 953,828
Int. Cl.² F16F *1/06*
U.S. Cl. 267—170 **4 Claims**

1. A spring recoil assembly for use in a crawler type track roller frame comprising:

elongated tubular housing (28,46) having opposed open ends and defining a spring receiving space;

a stop (36) at least partially closing one of said ends;

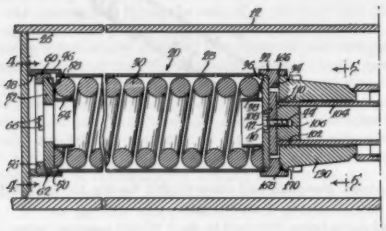
a compression coil spring (30) within said space and abutting said stop;

radially inwardly directed lip means (48) on the other end of said housing means and having an inner diameter greater than that of said spring;

an additional stop (52) within said other end and together with said first stop sandwiching said spring within said space, said additional stop having a periphery sized to

freely pass into said space through said other end past said lip means; and

a retainer (60,62) within said space between said additional stop and said lip means and abutting at least said lip means,



said retainer having a diameter greater than said inner diameter and at least one retaining portion smaller than said additional stop periphery said retainer comprising two elements each having an arcuate outer periphery of about 180°.

4,193,588

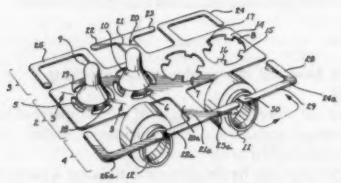
NIPPLE AND COLLAR RETAINER

Robert G. Doneaux, 1137 E. Orange, Tempe, Ariz. 85281

Filed May 9, 1977, Ser. No. 794,824

Int. Cl.[3] B25B *11/00*

U.S. Cl. 269—47 **5 Claims**



1. A retaining member for supporting baby bottle nipples and collars in automatic dishwashers, said member comprising in combination:

a. a planar member;

b. a first section developed as part of said planar member for detachably supporting the nipples, said first section including at least one aperture for receiving an individual one of the nipples, each said aperture including an inwardly extending tab for bearing against the surface of and supporting an aperture inserted one of the nipples; and

c. a second section developed as part of said planar member for detachably supporting the collars, said second section including at least one arm means for penetrably supporting an individual one of the collars.

4,193,589

TURNTABLE FOR CLOTH SPREADING MACHINE

Cecil S. Frederick, Nashville, Tenn., assignor to Cutters Exchange, Inc., Nashville, Tenn.

Filed Aug. 2, 1978, Ser. No. 930,178

Int. Cl.[3] B65H *29/46*

U.S. Cl. 270—31 **3 Claims**

1. A turntable adapted to abut the end of a cutting table having first and second longitudinal tracks spaced equidistantly on opposite sides of a longitudinal center line along the cutting table and adapted to support a cloth spreading machine having at least one track wheel adapted to roll along either of the longitudinal tracks, comprising:

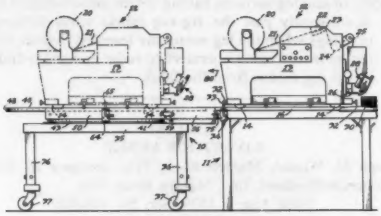
(a) a frame having an end portion adapted to abut the end of a cutting table,

(b) a rotary platform adapted to support a cloth spreading machine,

(c) bearing means supporting said rotary platform upon said frame for rotation about a vertical rotary axis,

(d) said frame end portion having a first end track and a second end track parallel to each other and adapted to align with the respective first and second longitudinal tracks on the cutting table when said end portion abuts the end of the cutting table and when said rotary axis is in alignment with the longitudinal center line,

(e) a straight platform track having opposite ends on said rotary platform and spaced from said rotary axis a distance equal to half the spacing between said first and



second end tracks, so that said straight platform track may be aligned end-to-end with said first end track in one rotary transfer position of said rotary position, and may be aligned end-to-end with said second end track in another rotary transfer position of said rotary platform, for the transfer of the cloth spreading machine, having a track wheel, between the cutting table and said rotary platform, when said end portion abuts the end of a cutting table and said rotary axis and the longitudinal axis are aligned,

(f) latch means on each of said first and second end tracks and on opposite ends of said platform track for latching one end of said platform track against said first end track in said one transfer position and for latching the opposite end of said platform track against said second end track in the other of said transfer positions.

4,193,590

SHEET SEPARATOR AND FEEDING APPARATUS

James G. Mongagnino, Monroe, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

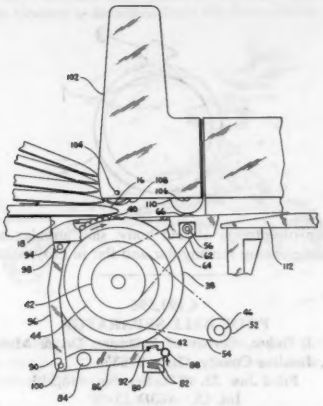
Filed Jan. 16, 1978, Ser. No. 869,483

Int. Cl.[3] B65H *3/06*

U.S. Cl. 271—119 **2 Claims**

1. A sheet separator and feeding apparatus comprising: a housing, a generally longitudinally disposed feed deck pivotably supported at one longitudinal end by said housing and having an opening therein, means for horizontally supporting said feed deck at the other longitudinal end, said supporting means including a first link rotatably supported within said housing, a second link having first and second ends, said first end being pivotably supported by said feed deck and said second end being pivotably attached to the first end of said first link and detent means supported by said housing and in engagement with the second end of said first link for holding said second end of said first link in a plurality of positions, a shaft rotatably received within said housing below said feed deck, a

first roller secured upon said shaft and having a portion received within said opening, a second roller spaced relative to



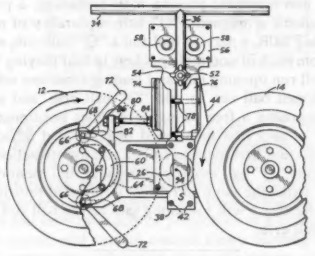
said first roller, said first and second rollers being in a generally common vertical plane, and means for rotating said shaft.

4,193,591

ADJUSTABLE BALL PROJECTING DEVICE

John K. Paulson, 14390 SW. Uplands Dr., Lake Oswego, Oreg. 97034

Filed May 11, 1978, Ser. No. 904,872
Int. Cl.[2] F41B *15/00*
U.S. Cl. 272—78 **5 Claims**



1. A ball projecting device, comprising:

(a) a base member,

(b) a pair of ball projecting members having confronting ball-engaging surfaces spaced apart laterally for gripping a ball between them, at least one of said members being driven for moving its ball-engaging surface in a ball projecting direction,

(c) mounting means interengaging the base member and ball projecting members for lateral adjustment of at least one of said members relative to the other for varying the spacing between said confronting surfaces,

(d) a ball feed chute including a pair of laterally disposed separate segments, and

(e) coupling means connecting said lateral segments each with a different one of said ball projecting members for varying the width of the feed chute simultaneously with varying the spacing between said confronting surfaces.

4,193,592

ROCKING, TURNING TOY

Raymond L. Bishow, 61 N. Laurel St., Ventura, Calif. 93003

Filed Sep. 22, 1978, Ser. No. 944,990
Int. Cl.[2] A63B *23/00*; B62B *11/00*
U.S. Cl. 272—114 **10 Claims**

1. A toy to be located and operated on a supportive surface comprising:

a planar base upon which the user is to be located on the upper surface thereof, a shaft connected to said base and extending from the lower surface thereof;

a bottom member having a top surface and a bottom surface, said bottom member to be located adjacent said lower surface of said planar base but spaced therefrom, said shaft located within said bottom member permitting rotational movement between said planar base and said bottom member, said top surface being of an area less than said lower surface of said planar base;

low frictional rolling means located between said lower surface of said planar base and said upper surface of said bottom member, said planar base being rotatable upon said bottom member by said low frictional rotational rolling means; and

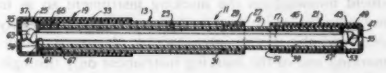
an enlarged protuberance attached to said bottom surface, said enlarged protuberance being spaced from the periphery of said bottom member, said enlarged protuberance to be in continuous contact with and rockingly move upon the supportive surface with the maximum tipping rocking movement being defined when the peripheral edge of said bottom member contacts the supportive surface.

4,193,593

ARM AND WRIST EXERCISER

Bradford W. Wilson, 1642-A Coriander, Costa Mesa, Calif. 92626

Filed Jun. 27, 1977, Ser. No. 809,977
Int. Cl.[2] A63B *21/00*
U.S. Cl. 272—137 **7 Claims**



1. An exercising device comprising:

outer and inner tubes, each of said tubes having a first end portion and a second end portion, said inner tube being at least partially within said outer tube, said tubes being capable of being manually grasped and pulled generally axially from a collapsed position to an extended position;

means for preventing said tubes from being pulled generally axially apart beyond said extended position;

an elongated resilient element extending at least part way through the inner member;

first means for attaching the elongated resilient element to said inner tube adjacent the first end portion thereof;

releasable means for attaching the elongated resilient element to the inner tube adjacent the second end portion

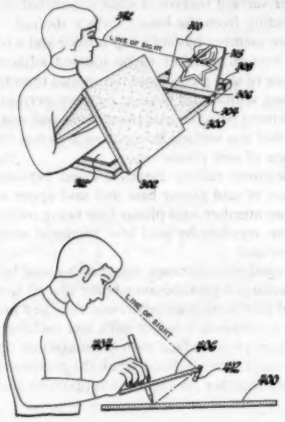
thereof at least when said tubes are in the collapsed position; and

said releasable means including means responsive to movement of said tubes from the collapsed position toward the extended position for releasing the elongated resilient element from the second end portion of said inner tube and attaching the elongated resilient element to the outer tube adjacent the second end portion thereof whereby the elongated resilient element can be forcibly resiliently elongated in pulling said tubes from the collapsed position to the extended position and can resist the movement of said tubes from the collapsed position to the extended position.

4,193,594
PARLOR GAME

Waldemar B. Schwauss, P.O. Box 21, Hornepayne, Ontario, Canada (POM 1ZO)

Filed Feb. 6, 1978, Ser. No. 875,186
Int. Cl.[2] A63F *9/06*
U.S. Cl. 273—1 R **5 Claims**



1. A parlor game comprising:

a playing board having a design;

reflective means mounted adjacent the playing board to form a mirror image of the design;

a marking instrument having a marking end for a player to trace the design; and

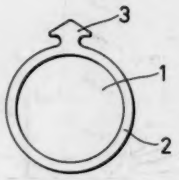
a shield mounted on the marking instrument so as to be movable therewith, and so disposed between the player's eyes and the design whereby the player can view the marking end of the marking instrument only through the reflective means.

4,193,595
RHYTHMIC EXERCISING APPARATUS

Seiji Abe, Oume, Japan, assignor to Kabushiki Kaisha Nihon Kensho, Tokyo, Japan

Filed Mar. 20, 1978, Ser. No. 888,694
Claims priority, application Japan, Mar. 23, 1977, 52-34283[U]
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—1 R **3 Claims**

1. A rhythmic exercising apparatus used by being placed on a floor, including: an annular body circular in shape formed with a hole sufficient to receive a foot; an index member shaped as an arrow, integral of said body to provide means for

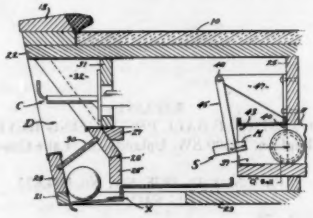


defining an orientation of said body; said annular body and index member being rectangular and flat in cross-section.

4,193,596
POOL BALL SEPARATOR

Raymond J. Baker, Corner of Palamino Dr. & Matson Rd., Merlin, Joseline County, Oreg. 97532

Filed Jun. 23, 1978, Ser. No. 918,340
Int. Cl.[2] A63D *15/00*
U.S. Cl. 273—11 C **12 Claims**



1. A pool table ball separator for separating a magnetic "Q" ball from non-magnetic playing balls including, a pool table having pockets, a magnetic "Q" ball, a plurality of non-magnetic playing balls, a playing ball and a "Q" ball crib, a ball run leading from each of said table pockets to said playing ball crib, a return ball run opening into and leading from one side of said first mentioned ball run to said "Q" ball crib, and separator means comprising a free swinging magnet positioned on the other side of said first mentioned ball run and adjacent said opening into said first mentioned ball run for attraction to only said magnetic "Q" ball moving along said first mentioned ball run and to strike the same and direct it into said return ball run opening whereby it will roll along said return ball run and into said "Q" ball crib.

4,193,597
COMBINATION VEHICLE AND LAUNCHER TOY ASSEMBLY

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

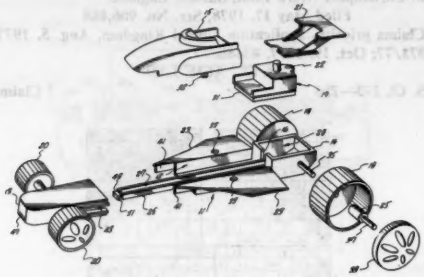
Filed Apr. 27, 1977, Ser. No. 791,568
Int. Cl.[2] A63H *33/06*
U.S. Cl. 273—405 **6 Claims**

1. A plurality of toy elements comprising:

first means including a plurality of removably attachable elements for forming a first vehicle, the elements including a nose element detachable from the first vehicle;

second means configurable from said first means for forming an ejection device, said second means comprising hammer means slideably mounted in a first said element, means for biasing said hammer means toward a first position, and means for retaining said hammer means in a position displaced against said bias and for releasing said hammer

means such that said bias force returns said hammer means to said first position, the ejection device adapted to secure the nose element and launch the nose element when the nose element is detached from the first vehicle, and



third means configurable from said first means for forming a top spinning and launching mechanism and for forming a mounting for said mechanism.

4,193,598

VIDEO GAME SYSTEM

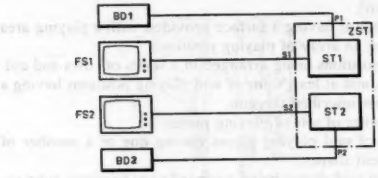
Jens Freese, Am Sandberg 92, Frankfurt am Main, Fed. Rep. of Germany (6000Ffm)

Filed Mar. 10, 1978, Ser. No. 885,250

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1977, 2711421

Int. Cl.[2] A63F *9/22*

U.S. Cl. 273—313 **3 Claims**



1. A video game system for simulating the functions of vehicles or groups of vehicles represented by spots on the screens of a plurality of television sets or projectors respectively controlled by and associated with individual control sets, said system comprising means connecting both said control sets and television sets or projectors to a common central control means, said central control means limiting the appearance of a respective vehicle or group of vehicles exclusively to the screen of the television set or projector associated therewith when the respective vehicles or groups of vehicles are positioned beyond an assumed field of visibility (horizon) relative to each other, said central control means causing both vehicles or groups of vehicles to appear on both said screens when their respective positions are within the assumed field of visibility relative to each other.

4,193,599

REEL SPINNING AND STOPPING DEVICES

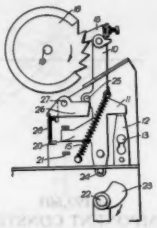
Joseph R. Heywood, Kingsgrove, Australia, assignor to Heywood Design Pty. Ltd., Kingsgrove, Australia

Filed Nov. 13, 1978, Ser. No. 960,479

Int. Cl.[2] A63F *5/04*

U.S. Cl. 273—143 R **3 Claims**

1. A device in which a plurality of reels carrying representations of symbols, letters, numbers or other indicia on their peripheries are assembled linearly spaced alongside each other and are free to rotate independently of each other wherein each reel has attached to its side and concentric with its axis a toothed sprocket having one tooth for each symbol represented on the periphery of the reel, the provision of means mounted adjacent each reel for both spinning the reel and stopping it including pawl means engageable between any pair of teeth of the toothed sprocket, lever means to which said pawl means is attached, solenoid controlled trigger means



arranged to hold said lever means in position in which said pawl means is engaged with the toothed sprocket, spring means arranged to cause said pawl means to move to rotate the toothed sprocket on actuation of said solenoid controlled trigger means, means to disengage said pawl means from said toothed sprocket and rotatable cam means arranged to restore said lever means and said pawl means to said position to stop rotation of said toothed sprocket.

4,193,600

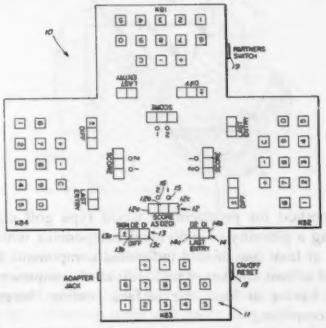
CRIBBAGE SCORING DEVICE

Roy Armstrong, Waltham, Mass. 02135, and William M. Kahn, Brookline, Mass., assignors to Roy Armstrong, Waltham, Mass.

Filed Dec. 19, 1977, Ser. No. 861,613

Int. Cl.[2] A63F *1/18*

U.S. Cl. 273—148 R **16 Claims**



8. A cribbage board scoring device comprising;

means defining a playing surface having at least first and second player stations,

first and second keyboard input means associated, respectively, with the first and second stations,

means responsive to said first and second input means for providing respective first and second cumulative counts,

first and second means associated, respectively, with the first and second stations for displaying each cumulative count to provide cumulative scoring information for each player,

means responsive to said first and second cumulative counts for providing a difference count and the polarity thereof respresentative of the difference between the scores between players continuously during the game,

and first and second means associated respectively, with the first and second stations for displaying the difference count along with a polarity indication,

a positive polarity of one station indicating a difference gain and a negative polarity at the other station indicating a difference loss.

4,193,601

SEPARATE COMPONENT CONSTRUCTION WOOD TYPE GOLF CLUB

Walter L. Reid, Jr.; Ralph L. Delano, both Mattapoisett, and John W. Jepson, Marion, all of Mass., assignors to Acushnet Company, New Bedford, Mass.

Filed Mar. 20, 1978, Ser. No. 887,883
Int. Cl.[2] A63B *53/04*
U.S. Cl. 273—167 R **7 Claims**

1. A method for producing a wood type golf club head comprising a plurality of individual components which mate together, at least one of said individual components being of metal, and at least another of said individual components being of wood having at least one surface coating thereon, said method comprising:

(a) separately forming the individual components;

(b) separately final finishing each component prior to assembly thereof into the golf club head, said final finishing including the application of at least one said surface coating on the wood component; and

(c) assembling the final finished individual components into a final finished golf club head.

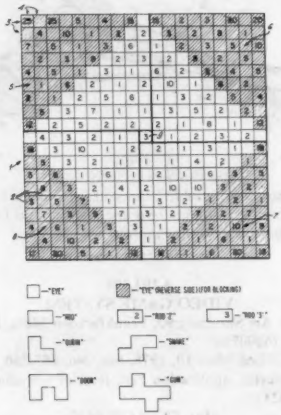
4. A final finished wood type golf club head comprising a plurality of individual components which mate together, at least one of said individual components being a metal reinforcing collar, and at least another of said individual components being a wood club head block having at least one surface coating thereon, and each of said individual components having been final finished prior to assembly thereof into the final finished golf club head.

4,193,602

BOARD GAME

Christopher M. Eliot, 55A, Frogmore St., Abergavenny, Gwent, Wales, and Edward B. Taylor, Eastbourne, England, assignors to Christopher Mark Eliot, Sussex, England

Filed May 17, 1978, Ser. No. 906,488
Claims priority, application United Kingdom, Aug. 5, 1977, 32971/77; Oct. 19, 1977, 43480/77
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—236 **7 Claims**



1. Apparatus for playing a board game, said apparatus comprising:

a. a board,

b. said board having a surface provided with a playing area having an array of playing positions,

c. said positions being arranged in a series of rows and columns, and at least some of said playing positions having a number inscribed thereon,

d. a number of sets of playing pieces,

e. each of said playing pieces having one of a number of different shapes,

f. each of said shapes being arranged so as to cover, substantially exactly, a whole number of said playing positions on said playing area,

g. each of said different shapes covering a different number of said playing positions, and each of said sets including at least one piece of each of said different shapes,

h. and said playing area defining an inner and an outer arena, said inner and outer arenas being distinguishable one from the other, and

i. and said numbers on said playing positions in said outer arena comprising a total greater than those on said playing positions in said inner arena.

4,193,603

SEALING SYSTEM FOR A TURBOMACHINE

Vijay K. Sood, Murrysville, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 21, 1978, Ser. No. 972,125
Int. Cl.[2] F16J *15/40*
U.S. Cl. 277—3 **12 Claims**

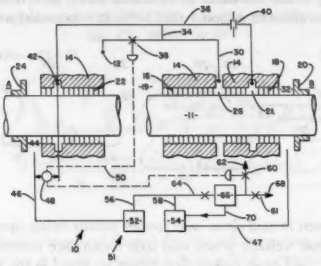
1. A seal system for a turbomachine comprising:

a first pressure reducing seal for reducing the pressure of a process fluid flowing therethrough;

first conduit means for delivering a first portion of the fluid to a first relatively low pressure operating region;

second conduit means for delivering a second portion of the fluid to a sealing region operating at a pressure somewhat higher than the pressure of the first operating region;

a second pressure reducing seal in fluid flow communication with the sealing region and a second operating region having a pressure intermediate the sealing region and the first operating region; and



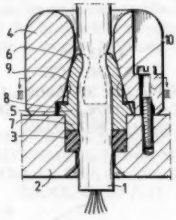
flow regulating means for selectively regulating the flow of fluid between the sealing region and the first operating region to maintain the fluid pressure differential between the sealing region and the second operating region at a substantially predetermined magnitude.

4,193,604

MEANS FOR CARRYING A CABLE THROUGH A WALL

Hannu Sarvanne, Vantaa, Finland, assignor to Oy. E. Sarlin Ab, Helsinki, Finland

Filed Sep. 21, 1978, Ser. No. 945,194
Claims priority, application Finland, Mar. 17, 1978, 780855
Int. Cl.[2] F16B *7/02*
U.S. Cl. 277—117 **1 Claim**



1. An apparatus for carrying a cable through a wall, such as a motor wall, comprising: a sealing ring encircling said cable disposed between said motor wall and said cable to form a water tight condition therebetween; an elongated clamping member, said clamping member is in proximity to said sealing ring, abutting said wall to surround said cable, said clamping member being further defined by integral gripping portions to engage said cable, said gripping portions having outer sloping surfaces; and an outer sleeve; said outer sleeve is disposed about said clamping member and is provided with interior sloping surfaces for co-action with said sloping surfaces of said clamping member to urge said gripping elements into gripping engagement with said cable when said clamping member is tightened.

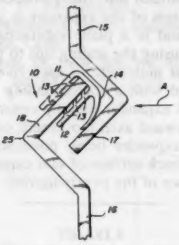
4,193,605

SEAL FOR DAMPER BLADES

Louis Josephson, Yonkers, N.Y., assignor to American Hardware & Paint Co., Inc., Elizabeth, N.J.

Filed May 5, 1978, Ser. No. 903,153
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—184 **6 Claims**

1. A damper having a plurality of pivoted blades adapted to have their edge portions overlap when the damper is in its closed position, one of said edge portions at each overlapping position being inserted into the open end of an elongated U-shaped strip formed of rigid material of U-shaped cross-section, said U-shaped strip providing side walls the interior of at least one of which carries resilient teeth pointed toward the closed portion of the U, said strip having a resilient sealing



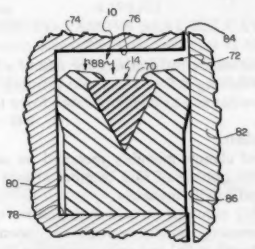
member in the form of a flexible flap extending away from said strip and terminating at one side of said strip, said strip being carried by the blade edge remote from the intended air flow through the damper and said flap engaging the edge portion of the adjoining blade at the overlap position so that air tending to move through said damper will bias said flap toward said adjoining blade to strengthen the seal.

4,193,606

MACHINERY SEAL

Dennis H. Iverson, 3557 Suniland Dr., Salt Lake City, Utah 84109

Continuation of Ser. No. 682,121, Apr. 30, 1976, abandoned.
This application Jun. 15, 1978, Ser. No. 915,803
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—205 **5 Claims**



1. A composite seal assembly comprising:

an annular elastomeric boot having a central axis and having:

A base portion having a flat front and parallel radially backwardly extending inner and outer side walls,

a bifurcated portion contiguous with and inclined backwardly radially away from the parallel inner and outer base side walls a given distance and then reversibly beveled backwardly radially toward the parallel inner and outer base side walls to form radially inner and outer annular pointed sealing lips which intersect in a plane perpendicular to the central axis,

an annular generally V-shaped groove having the wide section thereof annularly opening through the rear of the boot in the bifurcated portion opposite the flat front of the base portion such that said wide section of the groove and said inner and outer annular pointed sealing lips are in substantially the same plane,

a pair of annular ribs contiguous with the reversely beveled portion of the sealing lips forming the rearmost portion of the boot and having flat undersides overlying the V-

shaped groove restricting the annular opening thereof, and

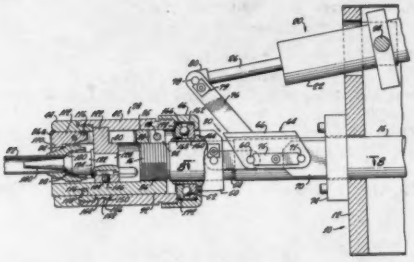
a wedge shaped annular elastomeric expander having flat sides and dimensions slightly larger than the space defined by the V-shaped groove and overlying annular ribs and having the widest portion adapted to fit into the widest portion of the V-shaped groove said wedge shaped expander being deformed into the V-shaped groove such that the greatest mass of the expander is just forward of the annular ribs and in a plane substantially even with the sealing lips causing the sealing lips to be biased apart and having the flat underside of each overlying annular rib firmly engaged with a corresponding flat surface of the wedge shaped expander thereby constraining the expander from backward axial movement out of the V-shaped groove, said expander being positioned in said groove such that the back surface of said expander is forward of the back surface of the overlying ribs.

4,193,607

CHUCK WITH OPPOSED GRIPPING

John Pearson, Garden Grove, and Homer L. Eaton, Leucadia, both of Calif., assignors to Eaton-Leonard Corporation, Carlsbad, Calif.

Filed Mar. 30, 1978, Ser. No. 891,922
Int. Cl.[2] B23D *31/40*
U.S. Cl. 279—1 DC **25 Claims**



1. A rotatable chuck for grasping the end of a hollow elongated member having a flared end and a fitting thereon and exerting both radial and axial compressive force thereon comprising,

a rotatable shaft,

a plurality of clamps movably mounted on said shaft for pressing the outside of said member at said end thereof radially and axially inwardly,

a pilot slidably mounted on said shaft and having a tapered end for pressing radially and axially outwardly against said member in radial and axial opposition to said clamps, said pilot having a radially projecting tongue on a rear portion thereof,

a sleeve slidably mounted on said shaft, said sleeve including first means for engaging said tongue to press said pilot axially and including second means for engaging said clamps to press said clamps inwardly, and

means for driving said sleeve into engagement with said tongue and clamps for pressing said pilot axially and radially outwardly against said member in opposition to said clamps.

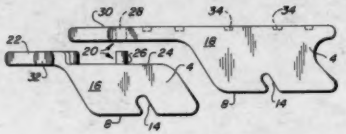
4,193,608

COMBINATION WAGON AND SLED

Arthur S. Gunderson, P.O. Box 215, Minooka, Ill. 60447

Filed Sep. 15, 1978, Ser. No. 942,575
Int. Cl.[2] B62B *13/18*
U.S. Cl. 280—8 **10 Claims**

1. Combination sled and wagon comprising a cargo transportable vehicle having first and second side means, cargo carrying deck means for supporting a cargo thereon between said first and second side means, runner means disposed on said first and second side means, said side means having open ended slots therein, and wheel means having axle means adapted to be disposed in said slots and adapted to be removed therefrom, including an axle shaft, said slots having a narrow width corresponding to the diameter of said axle shaft, said wheel means being operative to support said vehicle when said axle means



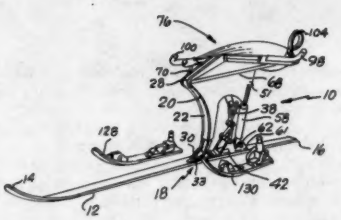
are disposed in said slots, said runner means being operative to support said vehicle when said axle means are removed from said slots, said open ended slots being inclined in the direction of forward movement of said vehicle to minimize drag and to facilitate forward movement thereof on a surface when said runner means are in sliding contact with said surface, said cargo carrying deck means being wide enough to support a person lying thereon.

4,193,609

SKI DEVICE

Fred L. Bissett, 1300 Florence St., Aurora, Colo. 80010

Filed Mar. 17, 1978, Ser. No. 887,789
Int. Cl.[2] B62B *13/00*
U.S. Cl. 280—12 K **26 Claims**



1. A ski device, which comprises:

an elongated runner;

seating means pivotally mounted at its forward end to said runner;

anti-sway means pivotally mounted between said seating means and said runner; and

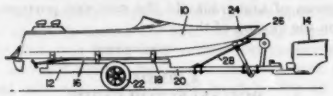
shock-absorbing means pivotally mounted between and extending downwardly and forwardly form the rear portion of said seating means to said runner, wherein the distance between the pivotal mount of said forward end of said seating means to said runner and the pivotal mount of said shock-absorbing means to said runner is approximately the same as the distance between the front and rear foot bindings of a regular, foot-mounted ski.

4,193,610

SHOCK ABSORBING DEVICE FOR AUTOMOBILE BOAT TRAILERS

David C. Miller, III, P.O. Box 92, Petaluma, Calif. 94952, assignor to David Charles Miller, III, Petaluma, Calif.

Continuation of Ser. No. 762,984, Jan. 27, 1977, abandoned. This application Jul. 20, 1978, Ser. No. 926,351
Int. Cl.[2] B60P *3/10*
U.S. Cl. 280—414 R 3 Claims



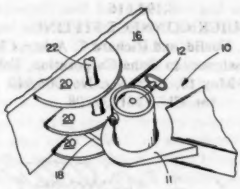
1. A shock absorbing device for use on an automobile boat trailer having a frame carrying a boat which comprises:
- a flexible floating bar secured at one end to the frame and having a receptacle near its other end adapted to be removably secured to the bow of the boat carried on said trailer;
- a boat engaging assembly carried on the floating bar near said receptacle and having a bow pad supporting the bow of said boat; and
- a pair of automotive type shock absorbers straddling the floating bar, each being attached at its lower end to the frame and being attached at its upper end to one side of the boat engaging assembly to control flexure of the floating bar within predetermined limits, each of said shock absorbers providing a resilient force which tends to maintain contact between said bow pad and bow, said floating bar being resiliently flexed to apply tension to the bow of the boat through said receptacle;
- whereby said flexible floating bar and shock absorbers interact applying tension and compression forces respectively to the bow of the boat while simultaneously permitting shock absorbing motion of both said receptacle and bow pad.

4,193,611

TRAILER HITCH ADAPTER

Harold E. Fisk, 3211 Hayes St., Marne, Mich. 49435

Filed Oct. 11, 1978, Ser. No. 950,267
Int. Cl.[2] B60D *1/14*
U.S. Cl. 280—415 A 20 Claims



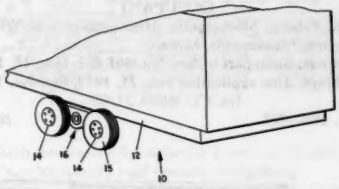
1. An adapter for coupling a lunette-type trailer hitch ring to a ball-type tow hitch comprising:
- an elongate cylindrical post for axially receiving a lunette-type hitch ring therearound;
- an axially extending aperture disposed in said cylindrical post for receiving a ball-type trailer hitch therein;
- a generally radially extending aperture extending through said cylindrical post;
- a shaft for insertion in said radially extending aperture and pinning a ball thereto; and
- means for preventing axial removal of the hitch ring comprising a pair of tubular members, each of said members being oppositely disposed, radially and outwardly extending from said cylindrical post to define said radially extending aperture and said means for preventing axial removal of the hitch ring.

4,193,612

ELASTOMERIC SUSPENSION SYSTEM FOR WHEELED VEHICLES

Lloyd D. Masser, Muskegon, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Jun. 19, 1978, Ser. No. 916,942
Int. Cl.[2] B60G *11/60*
U.S. Cl. 280—681 12 Claims



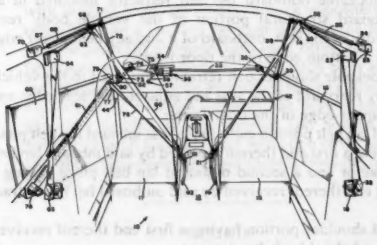
1. A suspension system for a wheeled vehicle comprising:
- an elongated equalizer beam rockably mounted at a central portion thereof to a load-supporting member of the vehicle;
- a pair of axles pivotably mounted to the equalizer beam through a rigid radius rod for vertical translational movement with respect to each end thereof; and
- a cylindrical elastomeric spring means mounted between each axle and the equalizer beam and vertically above each axle to absorb jounce deflections of the axle with respect to the equalizer beam.

4,193,613

MOTORIZED PASSIVE SEAT BELT SYSTEM

Joseph M. Cachia, Knoxville, Tenn., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Sep. 28, 1977, Ser. No. 838,800
Int. Cl.[2] B60R *21/02*
U.S. Cl. 280—804 8 Claims



1. In a vehicle passive restraint system for automatically positioning a seat belt about a vehicle occupant and a motor for movement of a device unassociated with said passive restraint system, the improvement comprising:
- winding means for moving said belt to a first, noninterfering position upon the opening of a door of the vehicle so as to permit free ingress to and egress from said vehicle by said occupant, said seat belt being movable to a second, occupant restraining position upon closing of said door;
- means drivingly connecting said motor and said winding means when said door is opened;
- switch means responsive to the opening and closing of said

door, said switch means being electrically connected to said motor means; and

said drivingly connected means including a gear box associated with said motor and including separate solenoids for each of said winding means and a solenoid for said unassociated device, said solenoid for said winding means being electrically connected to said winding means and said switch means and said solenoid for said device being electrically connected to said device, and wherein each of said solenoids is electrically connected to said motor means.

4,193,614

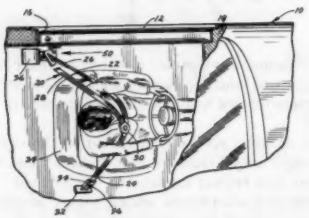
PASSIVE RESTRAINING BELT FOR SEATED VEHICLE OCCUPANT

Larry E. Felsing, Minneapolis, Minn., assignor to William A. Braddock, Minneapolis, Minn.

Continuation-in-part of Ser. No. 861,403, Dec. 16, 1977, abandoned. This application Feb. 21, 1979, Ser. No. 13,163

Int. Cl.[2] B60R *21/02*

U.S. Cl. 280—804 **28 Claims**



1. The combination with a vehicle having a body with a floor and provided with a door frame, a door hingedly mounted at a forward edge thereof with respect to said door frame and a vehicle seat accessible through said door frame, of a passive restraining belt arrangement, said restraining belt arrangement including:

A. a restraining belt comprising a two-piece lap belt portion and a shoulder belt portion;

B. a lockable inboard lap belt retractor mounted adjacent the vehicle floor body, rearwardly of the vehicle seat and inboard of it;

C. a lockable outboard lap belt retractor mounted in an outboard structural portion of the vehicle body rearwardly of the seat, outboard of it and adjacent a rear edge and a bottom edge of the door frame;

D. a lockable shoulder belt retractor mounted to the vehicle body rearward of the seat and adjacent the rear edge and an upper edge of the door frame;

E. said lap belt portion including a first inboard lap belt piece having a first end thereof received by said inboard lap belt retractor and a second outboard lap belt piece having a first end thereof received by said outboard lap belt retractor;

F. said shoulder portion having a first end thereof received by said shoulder belt retractor;

G. means for fastening second ends of said inboard lap belt piece, said outboard lap belt piece and said shoulder belt portion to each other;

H. an upper track mounted in an outboard edge portion of the vehicle roof and extending from a rear end portion positioned adjacent said shoulder belt retractor to a front end portion positioned adjacent a forward edge of the door and door frame;

I. a lower track mounted in a lower edge portion of said vehicle door adjacent the seat and extending from a rear end portion positioned adjacent said outboard lap belt retractor when said door is closed to a front end portion positioned adjacent the forward edge of said door and door frame;

J. an apertured outboard lap belt holder encompassing said outboard lap belt piece and means supporting said holder for movement along said lower track;

K. an apertured shoulder belt holder encompassing said shoulder belt portion and means for supporting said holder for movement along said upper track; and

L. means to move said belt holders from rear end portions of said tracks to front end portions thereof upon the opening of said door, and to move said holders from the front end portions of said tracks to the rear end portions thereof upon the closing of the door.

4,193,615

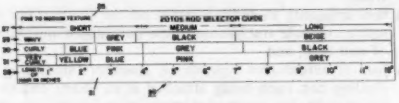
ROD SELECTOR GUIDE

Sharon S. Memmott, Cincinnati, Ohio, assignor to Zotos International, Inc., Darien, Conn.

Filed May 30, 1978, Ser. No. 910,284

Int. Cl.[2] B42D *15/00*

U.S. Cl. 283—1 A **12 Claims**



1. A rod selector guide for assisting hairdresser to select an optimum rod diameter for use in permanent hair waving, the rod selector guide comprising a hand-holdable instrument incorporating an information display having

A. first indicia representing alternative hair textures;

B. second indicia representing alternative curl configurations;

C. third indicia

a. representing various hair lengths, and

b. cooperatively associated with the second indicia in the information display; and

D. fourth indicia

a. representing alternative rod diameters, and

b. positioned in the information display in cooperative association with the second and third indicia,

whereby the optimum rod diameter for any curl configuration at any hair length is readily determinable.

4,193,616

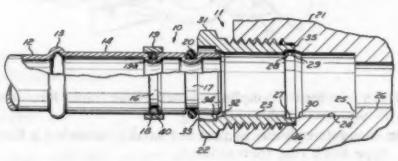
QUICK CONNECT FITTING

Charles R. Sarson, Euclid, and Richard C. Acker, Chagrin Falls, both of Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed May 18, 1978, Ser. No. 906,940

Int. Cl.[2] F16L *37/08*

U.S. Cl. 285—39 **14 Claims**



1. A quick connect coupling providing a body assembly having a tube end receiving passage with a seal portion and a radially extending wall for positioning a lock ring, and a tube, said tube having a peripheral groove, a snap lock ring bridging between said groove and said radially extending wall operating to lock said end portion in said passage when said end portion is assembled in said passage, seal means separate from said lock ring providing a fluidtight joint between said end portion and

body assembly, said body assembly including a body member and a nut threaded to said body member, said radially extending wall being formed on said nut substantially adjacent the inner end thereof, said nut having a counterbore at its inner end, said radially extending wall being provided by the inner end of said counterbore, said nut being threaded to the body member until the inner end of said nut bottoms on said body member, said groove having a side wall adapted to engage said ring and apply outwardly directed radial pressure and axially directed longitudinal pressure to said ring to urge said ring into longitudinal contact with radially extending wall and to urge said ring away from the bottom of said groove upon the application of an axially outwardly directed pulling force on said tube, said lock ring being held within said groove prior to insertion into said passage by a circumferential band slidable along said tube and assembly, said band having an outside diameter greater than the diameter of said tube end receiving passage so that said band is removed from engagement with said lock ring as the lock ring enters the passage.

4,193,617

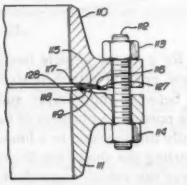
SEALED CONNECTION

Gifford L. Hitz, 1661 Bel Air Rd., Los Angeles, Calif. 90024

Division of Ser. No. 892,745, Apr. 3, 1978. This application Jul. 24, 1978, Ser. No. 927,634

Int. Cl.[2] F16L *23/00*

U.S. Cl. 285—336 **1 Claim**



1. In a sealed connection for two pipe members defining an axis, the combination comprising

(a) a generally radially facing first annular shoulder at the end of one of the pipe members, and a generally radially facing second annular shoulder at the end of the other of the pipe members, the first and second shoulders respectively facing radially outwardly and inwardly, said pipe member ends closely facing one another axially,

(b) and an annular, diaphragm type metallic seal having one edge adjacent said first shoulder and another edge adjacent said second shoulder, said seal in unstressed condition having arcuate cross sections in axial radial planes and extending between said two edges, said second radially facing shoulder being offset axially relative to said first radially facing shoulder when the ends of the pipe members are interengaged, whereby relative closing together of the pipe ends effects over-center flexing of the seal extending between said shoulders to tightly and annularly engage at least one of said member ends and to tightly interengage said edges with the respective shoulders,

(c) said pipe member ends having stop surfaces which interengage, radially inwardly and outwardly of said shoulders, to limit said closing together of the pipe ends and to enclose the seal,

(d) said one member forming a recess into which said second shoulder is received, and said other member forming a recess into which said first shoulder is received, when said stop shoulders are interengaged,

(e) said members having frusto-conical walls respectively extending away from said shoulders and adjacent opposite faces of the seal to confine the seal when the stop shoulders interengage,

(f) substantially the entire side of the seal facing one pipe member being concave toward that pipe member, and substantially the entire side of the seal facing the other pipe member being convex toward that pipe member.

4,193,618

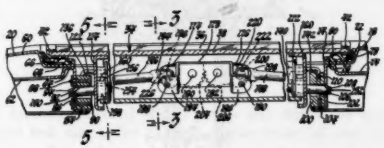
LATCH MECHANISM FOR REMOVABLE ROOF CLOSURE

Charles H. Lee, Almont, and Harry H. Fetters, Royal Oak, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1977, Ser. No. 859,289

Int. Cl.[2] E05C *9/04, 5/00*

U.S. Cl. 292—7 **4 Claims**



1. A latch mechanism for securing a removable roof closure panel in a vehicle body roof opening comprising:

first and second keepers mounted on the vehicle body at opposite sides of the roof opening;

first and second latch bolts movably mounted on the closure panel and having first end portions adapted for respective latching engagement with the keepers upon extension away from one another and unlatching disengagement from the keepers upon retraction toward one another;

first and second locating members mounted on the closure panel and respectively engageable with the first and second keepers to locate the closure panel longitudinally and transversely of the roof opening and transversely align the latch bolts with the keepers, said locating members being longitudinally adjustable on the closure panel to adjust the longitudinal position of the closure panel;

first and second operating levers having first ends pivotally mounted on the closure panel for movement about spaced axes and having second ends respectively pivotally connected with second end portions of the first and second latch bolts to extend and retract the latch bolts upon rotation of the operating levers;

means for rotating one of the levers;

and intermeshing gear teeth provided on the first and second operating levers to simultaneously rotate the second lever with the first lever, the levers rotating oppositely of each other between a latching position wherein the levers are located generally colinear with each other and with the latch bolts to effect extension of the latch bolts and latching engagement thereof with the respective keepers, and an unlatching position wherein the levers are located generally parallel to one another and normal to their respective latch bolts to effect retraction of the latch bolts and unlatching disengagement thereof from the respective keepers.

4,193,619

DOOR LATCH

Torsti T. T. Jerila, Rowland Heights, Calif., assignor to Acme General Corporation, San Dimas, Calif.

Filed May 15, 1978, Ser. No. 906,261

Int. Cl.[2] E05C *1/06*

U.S. Cl. 292—168 **35 Claims**

1. A door latch comprising:

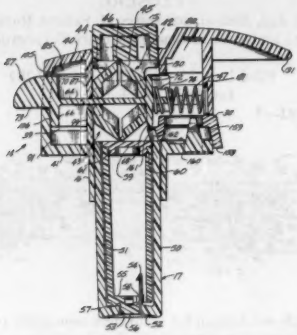
a housing;

a slidable latch bolt disposed within the housing, the latch bolt being slidable between an extended position in which a portion of the latch bolt lies outside the housing, and a retracted position in which said portion of the latch bolt lies at least partially inside the housing;

spring means for biasing the latch bolt into its extended position;

a movable latch bolt actuating button accessible from the outside of the housing; and

a linkage disposed in the housing between the housing, the



button, and the latch bolt, the linkage bearing against the housing, the button, and the latch bolt without attachment to the housing, the button, or the latch bolt to slide the latch bolt into the retracted position in opposition to the spring means responsive to movement of the actuating button.

4,193,620

DOOR LATCH

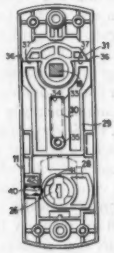
Franco Giussani, Via Oslavia, 80, Desio (Milan), Italy

Filed Jan. 26, 1978, Ser. No. 872,657

Claims priority, application Italy, Jan. 26, 1977, 19659 A/77

Int. Cl.[2] E05C *1/12*

U.S. Cl. 292—169.17 **7 Claims**



1. A door lock comprising inner and outer means for attachment at inner and outer surfaces of a door, latching means between said attachment means for latching a door to an associated door jamb, rod means for operating said latching means from the exterior of said inner and outer attachment means, locking means for selectively permitting and preventing rotation of said rod means from a door latching position to a door unlatching position, said locking means including a locking slide mounted for sliding movement upon one of said inner and outer attachment means generally transversely toward and away from said rod means, means normally biasing said locking slide in a direction toward said rod means and away from said locking tab, means mounting a locking tab for pivoting movement about an axis generally parallel to the axis of said rod means between a first position at which said tab prevents sliding movement of said locking slide away from said rod means and consequently locks said rod means in said door latching position and a second position at which said tab permits sliding movement of said locking slide away from said rod means and consequently unlocks said rod means in said door unlatching position, and means for operating said locking tab from both the exterior and interior of an associated door.

4,193,621

BUMPERS FOR MOTOR VEHICLES

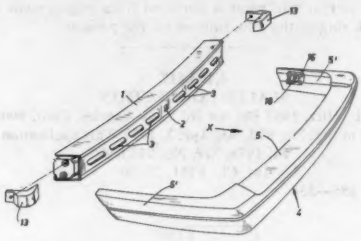
Rolf Peichl, and Günter Kaulmann, both of Osnabrück, Fed. Rep. of Germany, assignors to Wilhelm Karmann GmbH, Osnabrück, Fed. Rep. of Germany

Filed Mar. 27, 1978, Ser. No. 890,453

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2715986

Int. Cl.[2] B60R *19/06*

U.S. Cl. 293—142 **20 Claims**



1. A bumper for a motor vehicle having a U-shaped shield with a transverse portion attached to said bumper, central securing means between the bumper and the shield which is laterally stable in position, a plurality of further securing means which are laterally displaceable to a limited extent, said securing means supporting the shield for displacement in the longitudinal direction of the vehicle towards the bumper, said shield having lateral end portions disposed in relation to the bumper to extend round the sides of the vehicle, said shield being flexible and being comprised of at least one piece of resiliently material.

4,193,622

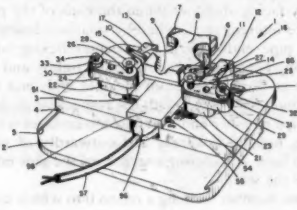
APPARATUS FOR INSERTING AND REMOVING CONTACT LENSES

David C. Overman, 4525 W. Twain Ave., #262, Las Vegas, Nev. 89103

Filed Jun. 15, 1978, Ser. No. 915,591

Int. Cl.[2] A61F *9/00*

U.S. Cl. 294—1 CA **9 Claims**



1. Apparatus for inserting and/or removing contact lenses comprises a base, forehead rest means for receiving and supporting the forehead of a user in a downwardly facing position, a pair of lens resting means for holding a contact lens in a substantially horizontal plane for insertion, mounting means for each of said lens resting means for removing said lens resting means between an operative position and an inopera-

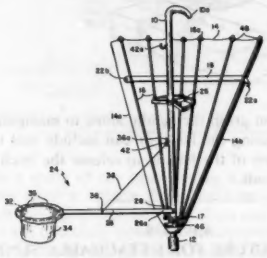
tive position, and a pair of lid-opening means mounted between the forehead rest means and the lens resting means.

4,193,623

CONCEALED DEVICE FOR REMOVING ANIMAL DROPPINGS

Marlene L. Forsythe, 11 Wiswall Cir., Wellesley, Mass. 02181; Amelia Laughlin, and Wayne Laughlin, both of 19 N. Main St., Muncy, Pa. 17756

Filed Jan. 22, 1979, Ser. No. 5,217
Int. Cl.[2] A47F *13/06*
U.S. Cl. 294—1 BB **7 Claims**



1. A device for removing animal litter comprising
A. an elongated handle,
B. an elongated arm,
C. means for pivotally connecting one end of the arm near the lower end of the handle so that the arm is swingable between a raised position wherein it lies adjacent to the handle and a lower position wherein it is oriented more or less horizontally,
D. bag securing means affixed to the opposite end of the arm, the total length of the arm and bag-securing means being less than that of the handle,
E. means operable adjacent the upper end of the handle for swinging the arm between its two positions,
F. a flexible shroud having a lower end secured near the lower end of the handle and having an upper end which extends above the bag-securing means when said arm is in its raised position, and
G. means for supporting the upper end of the shroud so that the shroud can be retained in a closed position wherein the shroud encircles and conceals the arm and bag-supporting means or an open position wherein said shroud reveals said arm and bag-supporting means.

4,193,624

PORTABLE WASTE CONTAINER

David J. Kerr, 536 Belgrove Dr., Kearny, N.J. 07032

Filed Oct. 21, 1977, Ser. No. 844,462
Int. Cl.[2] A47K *13/06*
U.S. Cl. 294—19 R **4 Claims**

1. Apparatus for collecting animal waste products comprising:
a tray, said tray including a generally rectangular bottom wall, a first pair of parallel side walls secured to said bottom wall along opposed edges thereof, a second pair of parallel side walls secured to said bottom wall along opposed edges thereof, said pairs of side walls being secured to each other along their respective lines of intersection, said bottom wall and said opposed pairs of side walls cooperating to define a main chamber open at its top and further including a partition wall extending between and secured to said first pair of side walls, said partition wall for dividing said main chamber into a waste compartment and a deodorant compartment;
cover means for selectively covering and uncovering said waste compartment and said deodorant compartment of said tray;
handle means pivotally secured to said tray for supporting said tray in carrying said tray from place to place for use; and

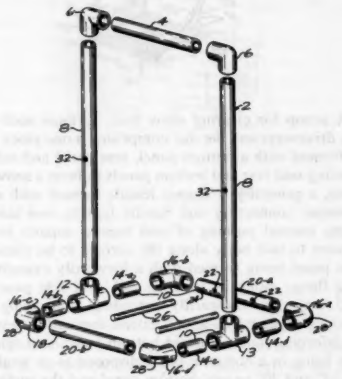
link means connected to said handle and said cover means, said link means for causing displacement of said cover means for said tray between covering and uncovering positions in response to rotation of said handle means.

4,193,625

BALL RETRIEVING AND STORAGE BAG

Ned H. Nelson, 9829 NE. 5th, Bellevue, Wash. 98004

Filed Dec. 12, 1977, Ser. No. 859,383
Int. Cl.[2] A63B *57/00*
U.S. Cl. 294—19 A **8 Claims**



1. An apparatus for retrieving and storing a tennis ball, said apparatus comprising:
a. a base comprising a frame;
b. a member in said frame;
c. the dimension between said frame and said member being less than the diameter of a tennis ball to prevent the tennis ball being pulled through said base by gravity;
d. said frame may be positioned over said tennis ball and then forced over said tennis ball so as to squeeze said tennis ball between said member and said frame and into said apparatus;
e. an enclosing means positioned above said frame and for storing said tennis ball;
f. a handle connecting with said frame;
g. said frame comprising a first, second, third and fourth right angle elbow, a first and a second Tee, a first and a second long pipe, a first, second, third and fourth nipple;
h. said first right angle elbow connecting with said first long pipe and said first long pipe connecting with said second right angle elbow and said second right elbow connecting with said first nipple and said first nipple connecting with

said first Tee and said first Tee connecting with said second nipple and said second nipple connecting with said third right angle elbow and said third right angle elbow connecting with said second long pipe and said second long pipe connecting with said fourth right angle elbow and said fourth right angle elbow connecting with said third nipple and said third nipple connecting with said second Tee and said second Tee connecting with said fourth nipple and said fourth nipple connecting with said first right angle elbow to form a frame enclosing an open area;

i. a first member and a second member connecting with said first long pipe and said second long pipe; and,

j. the distance between said members and the distance between said member and said Tee being less than the diameter of the tennis ball to prevent the tennis ball being pulled through said base by gravity.

4,193,626

SNOW SCOOP

James Vondracek, 2630 Wallace Dr., Flossmoor, Ill. 60422

Filed May 10, 1978, Ser. No. 904,526

Int. Cl.[2] **E01H** *5/02*

U.S. Cl. 294—54 **6 Claims**

1. A scoop for clearing snow from surfaces such as sidewalks, driveways and the like comprising a one-piece stamped body formed with a bottom panel, rear panel and side panels connecting said rear and bottom panels to form a snow receiving area, a generally U-shaped handle formed with a pair of legs, means connecting said handle legs to said side panels whereby manual pushing of said handle imparts horizontal movement to said body along the surface to be cleared, said bottom panel being formed with a forwardly extending reinforcing flange along its forward end, said side panels being formed with flat, outwardly extending reinforcing flanges along their upper edges which extend forwardly to join with said reinforcing flange for said bottom panel, said reinforcing flanges being in a common plane disposed at an angle of between 15° and 30° to said bottom panel and the surface to be cleared for increasing the rigidity of said body and facilitating shearing of snow from said surface, and said flange for said bottom panel extending forwardly from said bottom panel and terminating with a flange that is parallel and slightly below the plane of said bottom panel to form a leading edge of said scoop body.

4,193,627

LIFTING HOOK WITH SAFETY LATCH

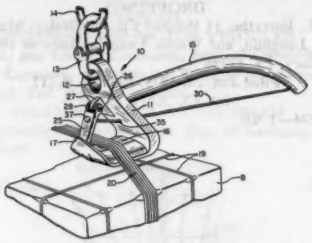
Albert W. Cranston, Oregon City, and William J. Rowell, Clackamas, both of Oreg., assignors to Cranston Machinery Co., Inc., Oak Grove, Oreg.

Filed Jul. 10, 1978, Ser. No. 922,831

Int. Cl.[2] **B66C** *1/36*

U.S. Cl. 294—82 R **5 Claims**

1. A lifting hook comprising a shank portion having a lifting connection in one end thereof, a hook portion on the other end of said shank portion projecting from one side of said shank portion, a safety latch arranged to close the gap between said shank and the point of the hook, an elongated handle rigidly mounted at one end on the opposite side of said shank, and a latch release member, said latch release member comprising a flexible tension member suspended between the opposite end of said handle and said shank portion and extending along said handle in spaced relation to a gripping portion of said handle so



that an operator can grasp the handle alone to manipulate the hook without releasing the latch or can include said tension member in his grasp of the handle to release the latch while manipulating the hook.

4,193,628

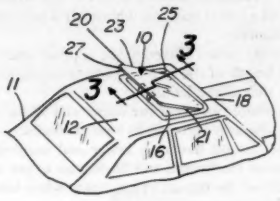
BAYONET STRUCTURE FOR DETACHABLE SUNROOF

Norman L. Sorensen, Detroit, Mich., assignor to Wisco Corporation, Ferndale, Mich.

Continuation-in-part of Ser. No. 820,105, Jul. 29, 1977. This application May 25, 1978, Ser. No. 909,386

Int. Cl.[2] **B60J** *7/08*

U.S. Cl. 296—137 B **6 Claims**



1. A removable, transparent panel for the roof of a vehicle, said panel having a hinged edge and an opening edge;

said opening edge having a separable fastener for joining said opening edge of said panel to a section of a frame extending about an opening in said roof;

said separable fastener having a handle member supported to the underside of the panel adjacent an edge thereof, said handle member being adapted for motion between a first position, wherein said opening edge of said panel adjacent to said handle member is forced into engagement with said frame, and the second position, wherein said opening edge is spaced with respect to said frame, said handle member being separable from said frame;

said hinged edge having bayonets which are attached to said hinged edge at one end, while the other ends of said bayonets pivot against a recessed section on said frame;

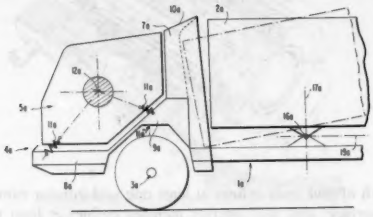
each of said bayonets having at said other ends an upright projection cooperating with said recessed section to hold each bayonet in hinged contact with said frame for a predetermined amount of rotation; and

said one end and said other end of said bayonets being connected by a bottom wall, said bottom wall being reinforced along each edge by a pair of upright walls, said upright walls having a maximum height near said one end and tapering toward said other end, said upright walls being spaced apart from said one end.

4,193,629
TRUCK WITH DRIVER CAB

Josef Merkle, Esslingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 19, 1978, Ser. No. 897,693
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1977, 2717661
Int. Cl.[2] B62D *25/00, 35/00*
U.S. Cl. 296—190 30 Claims

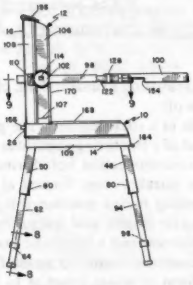


1. In a truck of the type having a driver cab resiliently mounted upon a vehicle frame, said driver cab having an operator's compartment having at least one seat in addition to control and operating elements, the improvement wherein said driver cab resiliently mounted on said frame comprises an operating unit, containing essentially only said operator's compartment, and a receiving unit containing any driver's cab mounted auxiliary units in the nature of wind deflectors, engine accessories and the like, and wherein said operating unit is elastically suspended upon said receiving unit for independent movement relative thereto.

4,193,630
SELF CONTAINING COLLAPSIBLE HIGH CHAIR

Blake H. Steele, 323 Westlake St., Cartago, Calif. 93520

Filed Sep. 5, 1978, Ser. No. 939,279
Int. Cl.[2] A47C *4/00*
U.S. Cl. 297—17 13 Claims

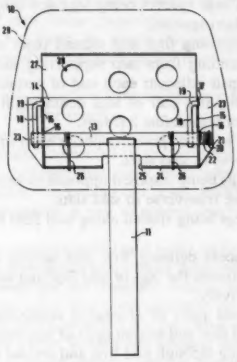


1. A self-containing collapsible high chair, comprising:
a hollow seat having an open lower side;
a hollow back having an open rear side;
the lower portion of said seat and the rear portion of said back having corresponding interfitting peripheral edges;
hinge means connecting said back to said seat for movement between an erected position with the back substantially upright on the upper rear portion of the seat, and a closed position with the seat and back joined at said interfitting edges and forming a closed case;
a pair of front legs and a pair of rear legs having hinged connections to said seat to move between an extended position inclined outwardly from the seat and a retracted position within the hollow seat;
each of said hinged connections including a support member fixed to the seat and a bearing block pivotally mounted on the support member on an axis extending substantially from front to rear of the seat, each one of the legs being pivotally attached to one of the bearing blocks on an axis perpendicular to the pivotal axis of the bearing block;
each of said legs having a telescopic lower portion;
a cross brace secured between the telescopic portions of each pair of legs and being adjustable to hold the legs apart in the extended position and to hold the legs in substantially parallel position for retraction into the seat;
arms adjustably mounted on said back and extending forwardly therefrom above the seat; and
a tray detachably secured to said arms.

4,193,631
HEAD/NECK SUPPORT FOR VEHICLE SEATS

William J. Hobley, Coventry, and William I. M. Rollason, Balsall Common, Nr. Coventry, both of England, assignors to Chrysler United Kingdom Limited, London, England

Filed Mar. 23, 1978, Ser. No. 889,546
Claims priority, application United Kingdom, Mar. 25, 1977, 12764/77
Int. Cl.[2] A47C *1/10*
U.S. Cl. 297—408 10 Claims



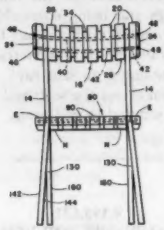
1. A head/neck support for a vehicle seat having a seat back comprising a post for mounting on the seat back, a spindle fixed to one end of the post and extending tranversely to the post, a head/neck rest having a rigid supporting frame including a pair of spaced walls provided with holes which receive and mount the frame on the spindle for rotational movement with respect to the spindle and for free axial sliding movement of the frame along the spindle, each of said walls having a plurality of apertures spaced in an arc around the spindle hole, two pins fixed to and extending radially of the spindle at spaced locations along the spindle and having projecting detents at their radially outer ends facing in one direction along the spindle to engage in selected apertures in the two respective walls of the rigid supporting frame to hold the frame against rotation and spring means acting between the frame and the spindle for biassing the frame along the spindle in a direction to hold the detents in engagement with the respective apertures in the walls, the head rest being adjusted by axial bodily movement of the frame along the spindle against the action of the spring means to release the detents from the apertures and then rotated to the required position and released to return the frame axially along the spindle and re-engage the detents with apertures in the walls corresponding to the new attitude of the head rest.

4,193,632

FURNITURE UNIT

B. Carson Russell, 12821 Marcy St., Omaha, Nebr. 68154

Filed Sep. 27, 1978, Ser. No. 946,122
Int. Cl.[2] A47C *1/12*
U.S. Cl. 297—446 **18 Claims**



1. A furniture unit comprising a substantially horizontal supporting surface assembly having spaced substantially parallel elongated slats,

spacers disposed between and holding apart adjacent ones of said slats,

some of said spacers being short-spacers as measured vertically,

other ones of said spacers being legs and longer vertically than said short-spacers,

said legs comprising first and second pairs of legs downwardly extending from said supporting surface and disposed one pair adjacent each end of certain ones of said slats whereby one pair of legs define right legs and the other pair of legs define left legs,

said first legs being disposed opposite each other on a first line transverse to said slats,

said second legs being disposed opposite to each other along a second line transverse to said slats,

said second legs being spaced along said slats from said first legs,

said short-spacers defining first and second short-spacers disposed between the legs of said first and second pairs of legs respectively,

first and second pairs of elongated connectors extending through said first and second pairs of legs respectively and also extending through said first and second short-spacers respectively,

the two connectors of each of said pairs of legs being spaced apart laterally of each other,

said legs and said short-spacers having horizontally extending holes extending transversely therethrough receiving said connectors respectively.

4,193,633

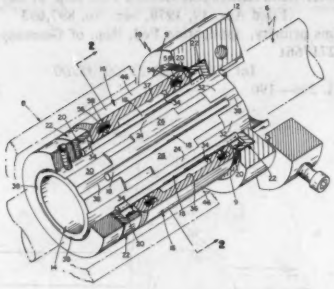
CORE CHUCK

Blaine Potter, Sharon, Mass., assignor to Double E Company, Inc., Brockton, Mass.

Filed Dec. 16, 1977, Ser. No. 861,451
Int. Cl.[2] B23B *31/40*
U.S. Cl. 279—2 R **14 Claims**

10. In a core chuck comprising an interior member having a longitudinal axis, n jaws generally surrounding the interior member, a plurality of circumferentially-spaced rollers radially intermediate the jaws and the interior member, and a plurality of camming surfaces projecting radially inwardly from said jaws and radially outwardly from said interior member, said rollers engaging said camming surfaces, that improvement wherein:

each of said camming surfaces is defined by moving a straight line which extends parallel to the axis of the interior member simultaneously radially and circumferentially such that the surface thus defined is convex outwardly relative to said longitudinal axis;



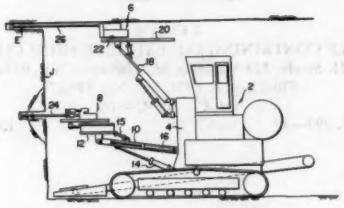
each of said jaws defines at least one said interior camming surface; and, said interior member defines at least n circumferentially spaced said exterior camming surfaces.

4,193,634

METHOD AND APPARATUS FOR EXCAVATION

Joji Nakamura, Kamakura, and Kihachiro Furumi, Hiratsuka, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 5, 1977, Ser. No. 857,755
Int. Cl.[2] E21C *25/60*
U.S. Cl. 299—17 **13 Claims**



1. A method of excavating a tunnel, shaft, channel or the like comrising the steps of:

(a) digging a hole in a rock bed or in the ground;

(b) inserting a rod of a fracturing apparatus in said hole, said rod having a communication hole formed therein in the axial direction, nozzle means formed at the leading end thereof and sealing means positioned both ahead of and behind said nozzle means, said fracturing apparatus having a water reservoir and a hydraulic booster;

(c) allowing pressurized water to spout from said nozzle means in the form of water jet so as to produce annular grooves in said hole impinged by the water jet, the pressurized water being introduced into said nozzle means from said water reservoir through said communication hole by the action of said hydraulic booster;

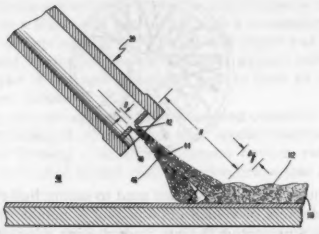
(d) sealing a space around said nozzle means radially defined by the outer periphery of said rod and an inner peripheral wall of said hole and axially defined by said sealing means positioned ahead of and behing said nozzle means; and

(e) spouting pressurized water from said nozzle means into said space thereby making a crack in said rock mass, said crack being started from said annular grooves in said hole, the water pressure of this step being less than that of step (c) so that the rock mass can be fractured along said crack by continuously spouting pressurized water into said space.

4,193,635
CONTROLLED CAVITATION EROSION PROCESS AND SYSTEM

Alagu P. Thiruvengadam, 10509 William Tell La., Columbia, Md. 21044, and Ambrose A. Hochrein, Jr., 18521 Kilt Ter., Olney, Md. 20832

Filed Apr. 7, 1978, Ser. No. 894,557
Int. Cl.[2] E21C 25/60; B08B 3/12
U.S. Cl. 299—17 17 Claims

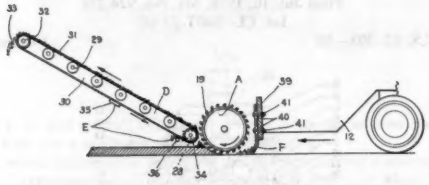


1. A method of selectively removing material from a solid body comprising the steps of:
- positioning an orifice of a predetermined size at a distance from the material to be selectively removed;
- generating a fluid flow through the orifice such that the cavitation number at the orifice exceeds the cavitation inception number for that orifice and such that a submerged cavitating flow field having bubbles is established in a body of the fluid between the orifice and the material to be removed;
- adjusting the flow velocity through the orifice to provide a selected cavitation intensity that exceeds the threshold erosion intensity of the material to be selectively removed; and
- allowing the bubbles to collapse adjacent to the material to be removed to selectively loosen and remove the material.

4,193,636
ASPHALT PAVING PLANER WITH CONVEYOR FORWARDLY OF CUTTING DRUM

Herbert E. Jakob, 8 Pritchard La., Taylors, S.C. 29687

Filed Jul. 10, 1978, Ser. No. 922,962
Int. Cl.[2] E01C 23/09
U.S. Cl. 299—39 6 Claims

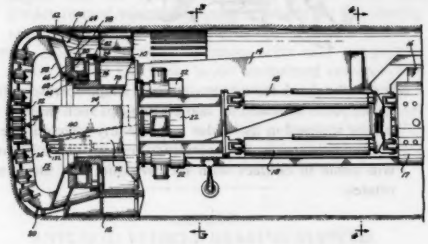


1. A self-propelled wheeled apparatus including a chassis for removing a thickness of asphalt paving and the like drivable in a forward direction comprising:
- a drum having spaced cutting elements thereon rotatably carried by said chassis extending below and in longitudinal alignment therewith;
- means carried by said chassis for driving said drum;
- a power operated conveyor having a charging point ahead of said drum in alignment therewith and adjacent thereto for receiving asphalt cuttings from said drum and the cutting elements carried thereby;
- means carrying said conveyor so as to extend upwardly and forwardly from said drum so as to discharge said cuttings into a truck moving forwardly in front of said wheeled apparatus; and
- a vertically adjustable scraper means carried adjacent said drum on a side of said drum opposite said conveyor.

4,193,637
ROTARY CUTTERHEAD FOR AN EARTH BORING MACHINE

Barry A. Spencer, Redmond, Wash., assignor to The Robbins Company, Seattle, Wash.

Filed Aug. 7, 1978, Ser. No. 931,384
Int. Cl.[2] E21C 25/16
U.S. Cl. 299—56 13 Claims



1. A main frame for a rotary cutterhead of an earth boring machine, said main frame comprising:
- an annular box beam by which the cutterhead is mounted onto an earth boring machine, for rotation about an axis of rotation;
- a box-like hub structure comprising peripheral wall means defining a center space;
- a plurality of radial spoke beams having inner ends which are integrally connected to the peripheral wall means of the hub structure and outer ends which are integrally connected to the annular box beam, each said radial spoke beam comprising a pair of spaced apart side plate members;
- roller cutter mounts within said radial spoke beams comprising wall members which extend transversely of the radial spoke means and are integrally connected at their ends to the spaced apart side plate members, to also function as structural brace members for the radial spoke beams;
- wherein the cutter mounts are adapted for installation and removal of roller cutters from the rear side of the cutterhead, and
- wherein said main frame is configured to provide an interior space for a workman which is large enough to provide room for installation and removal of roller cutters from behind the cutterhead.

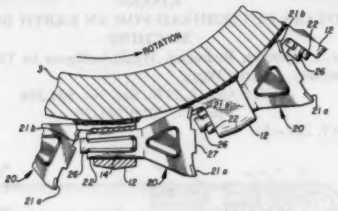
4,193,638
MULTIPLE TIP CUTTING BIT FOR ROTARY DRUM-TYPE CUTTER

William G. Heckenhauer, Bucyrus, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 12, 1978, Ser. No. 905,616
Int. Cl.[2] E21C 35/18
U.S. Cl. 299—89 7 Claims

1. A multiple tip cutting bit, for a rotary drum-type cutter laced with bit holders each of which has a tapered socket extending generally tangential to the drum surface, comprising:
- a tapered shank adapted to seat snugly in the matching socket of one of the bit holders; and
- a head integrally joined to the shank and having at least two diverging walls extending away from the shank, the divergent ends of said walls forming a face lying in a plane perpendicular to the centerline of the shank and having a

cutting tip at the outer edge of each divergent wall, wherein said cutting tips are symmetrically and equidistantly spaced about the projected centerline of the shank, and



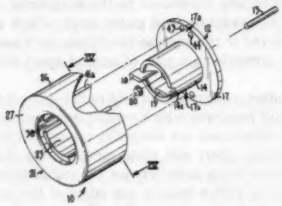
wherein the shank has a cross-sectional shape corresponding to the pattern formed by said cutting tips such that the bit can be indexed in its holder to place any selected one of said cutting tips in the operative position where it alone will come in contact with the workpiece as the cutter rotates.

4,193,639

MOUNTABLE WHEEL FOR TOY VEHICLE

Ronald R. Pauly, Mound; Thomas W. Good, Long Lake; John D. Hastings, Eden Prairie, and Kevin D. Ryan, Minneapolis, all of Minn., assignors to Tonka Corporation, Spring Park, Minn.

Filed Apr. 21, 1978, Ser. No. 899,102
Int. Cl.[2] B60B *5/02;* **A63H** *17/26*
U.S. Cl. 301—9 DH **8 Claims**



1. An easily mountable and demountable wheel for use on toy vehicles, said wheel comprising:

a. first wheel hub means adapted for rotatable mounting on an axle, said first wheel hub means including a cylindrical portion, a resilient, radially-extending disc-like portion disposed at one end of said cylindrical portion and laterally-extending flange means disposed at the other end of said cylindrical portion, said laterally-extending flange means being axially aligned with said cylindrical portion, said disc-like portion including first snap lock means; and

b. second wheel means having a portion simulating a tire, said second wheel means having a cylindrical opening defined therein for reception of the cylindrical portion of said first wheel hub means, said opening including recessed portions through which said flange means may axially move when mounting and demounting said second wheel means from said first wheel means, said second wheel means including second lock means for cooperation with the first lock means to prevent unintended rotation of said second wheel means with respect to said first wheel means, whereby said second wheel means may be held on said first wheel means entrapped between said flange means and said disc-like portion.

4,193,640

HUB CAP LOCKING DEVICE

Sylvanus B. Jones, Jones' Hill - 16 Bausum Dr., Annapolis, Md. 21401

Continuation-in-part of Ser. No. 852,815, Nov. 11, 1977, abandoned. This application Nov. 8, 1978, Ser. No. 958,803
Int. Cl.[2] B60B *7/00*
U.S. Cl. 301—37 AT **1 Claim**

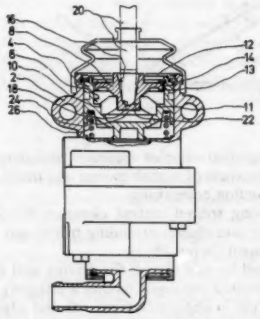
1. A hub cap locking device used to secure hub caps to the wheel adapters of vehicles comprising a metallic linkage enclosed in a protective flexible cover having a locking disc on each end with an aperture in the center of said disc to accommodate one bolt of a plurality of bolts on said wheel adapter and having affixed to both ends of said cable and overlapping said disc a metallic latch slidably mounted on a small metallic rectangular plate; said plate having flanges to retain said latch; said latch having a small rectangular aperture through its center through which is mounted to the said small rectangular plate a circular-flare headed locking screw the mounting of the latch being such that a bevelled edge of the said sliding latch can be guided tightly between the threads of said bolt on the wheel adapter and the locking screw can then be turn to lock said sliding latch against the said small rectangular plate whereby both said locking discs of the hub cap locking device can be secured to the said bolt on the wheel adapter after the hub cap locking device has been threaded through apertures of the inner rim of the hub cap or has been threaded through a hooked apparatus on the hub cap having sufficient length and flexibility in movement to allow the hub cap to be affixed securely to the rim of the wheel of the vehicle.

4,193,641

BRAKE VALVE

Erich Reinecke, Beinhorn, Fed. Rep. of Germany, assignor to WABCO Westinghouse GmbH, Hanover, Fed. Rep. of Germany

Filed Jul. 10, 1978, Ser. No. 924,279
Int. Cl.[2] B60T *17/00*
U.S. Cl. 303—50 **3 Claims**



1. A brake valve device comprising:

(a) a casing;

(b) a valve-actuating piston axially spring-biased in one

direction in said casing toward a limit position and having a coaxial stepped bore therein having a closed end oppositely disposed to an open end thereof;

(c) an annular spring seat member coaxially slidably disposed in a larger-diameter portion of said stepped bore adjacent the open end thereof;

(d) an annular spring member coaxially compressibly disposed within said valve-actuating piston with one end resting against an annular shoulder formed in said bore adjacent the closed end thereof,

(e) said spring seat member having an axial extension extending from a lower side thereof through a concentric opening in said spring member toward said closed end of said bore and having an annular shoulder against which the other end of said spring member rests to form an annular juncture therewith,

(f) spring seat member also having formed coaxially therein a funnel-shaped recess with the smaller-diameter end thereof forming a spherically-shaped bottom extending into and formed in said axial extension below said annular juncture;

(g) an axially movable push rod extending into said funnel-shaped recess with a free end thereof resting against said spherically-shaped bottom thereof for applying actuating force to said spring seat member for effecting axial movement of said actuating piston through said spring member; and

(h) an annular guide flange formed on the end of said valve seat member opposite said axial extension for guiding movement of the valve seat member in said bore, said guide flange having a spherically-shaped peripheral surface for facilitating movement thereof against the wall of said bore.

4,193,642

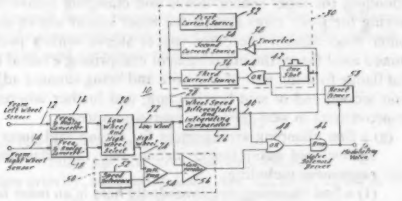
SKID CONTROL SYSTEM

Roger L. Miller, Ann Arbor, Mich., assignor to Kelsey Hayes Co., Romulus, Mich.

Continuation of Ser. No. 482,449, Jun. 24, 1974, abandoned. This application Jan. 13, 1976, Ser. No. 648,786

Int. Cl.[2] B60T *8/08*

U.S. Cl. 303—97 **35 Claims**



1. A skid control system for a vehicle having at least one wheel and a brake for said wheel comprising:

wheel deceleration detecting means for providing a current representative of the deceleration of at least one wheel;

reference generating means for generating a reference current of a first predetermined magnitude to represent a first rate of decline of said wheel speed including means for altering the magnitude of said reference current in response to an output signal to a reference current of a second predetermined magnitude to represent a second rate of decline of said wheel speed so that said reference current of said first and second predetermined magnitudes represents a predetermined wheel deceleration profile having said first and second rates of decline of said wheel speed;

comparator means for comparing said current representative of wheel deceleration and said reference current for providing said output signal upon the attainment of a predetermined relationship therebetween to cause said reference generating means to alter the magnitude of said reference current, said comparator means subsequently comparing said current representative of said wheel deceleration and said reference current of said first and second predetermined magnitudes for providing a subsequent output signal upon the attainment of said predetermined relationship between said current representative of wheel deceleration and said reference current of said first and second predetermined magnitudes, said comparator means being responsive to the degree that said current representative of wheel deceleration and said reference current depart from said predetermined relationship therebetween in a manner so as to be approximately responsive to the degree that the wheel deceleration departs from said predetermined wheel deceleration profile for terminating said further output signal; and

brake modulating means operative with said comparator means so that said brake is not modulated responsive to the provision of said first-mentioned output signal but is modulated responsive to the provision of said subsequent output signal, said brake modulating means being further responsive to the termination of said subsequent output signal for terminating the modulation of the brake.

4,193,643

ANTI-SKID VEHICLE BRAKING SYSTEMS

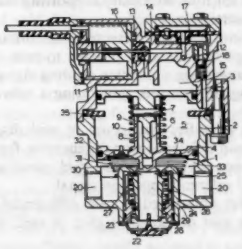
Frederick J. Knight, Leamington Spa, England, assignor to Girling Limited, Birmingham, England

Filed Jul. 13, 1978, Ser. No. 924,298

Claims priority, application United Kingdom, Jul. 13, 1977, 29335/77

Int. Cl.[2] B60T *8/02*

U.S. Cl. 303—118 **7 Claims**



1. A fluid-pressure operated anti-skid braking system for a vehicle comprising a wheel brake, a supply of operating fluid for actuating said brake, fluid-flow control means interposed between said supply and a connection to said brake and through which said operating fluid is supplied to said brake, means responsive to a skid signal for operating said valve means to relieve the brake pressure of said fluid supplied to said wheel brake at a skid point when the skid signal exceeds a predetermined value, a housing, and means in said housing defining a memory chamber for storing a memory pressure dependant upon a brake pressure occurring at said skid point to provide a changeover point between first and second stages of brake re-application, said first stage comprising the re-application of said operating fluid from said supply until an intermediate pressure less than the pressure at said skid point is attained at the changeover point, and said second stage comprising the continued re-application of said supply of operating fluid at a reduced rate of pressure increase, wherein said memory pressure is utilised to determine the magnitude of a force for operating said control valve means itself during said first and second successive stages of brake re-application, and wherein a movable wall in said housing defines at least a part of said memory chamber and is operatively connected to said valve

means, said movable wall having a first side which is exposed at all times to pressure in said memory chamber and a second opposite side which is exposed to said connection to said brake.

4,193,644

SERVO CONTROL SYSTEM

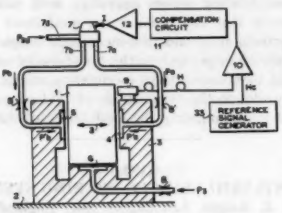
Masakazu Miyashita, Kokubunji, and Akira Kanai, Higashiyamato, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1978, Ser. No. 890,908

Claims priority, application Japan, Apr. 7, 1977, 52-39738; Apr. 26, 1977, 52-48028

Int. Cl.[2] **F16C** *35/00*

U.S. Cl. 308—9 **6 Claims**



1. A servo control system with closed loop control means for correcting a displacement of a member caused by an external force, said system comprising:

(a) base means as a foundation;

(b) supporting means secured to said base means for supporting said member;

(c) first and second hydrostatic pads provided on said supporting means for hydrostatically supporting said member with said supporting member;

(d) a displacement detector detecting an amount of the displacement of said member relative to said supporting means and transmitting a position reading signal;

(e) a reference signal generator generating a reference position signal;

(f) a differential amplifier connected to said displacement detector and said reference signal generator for transmitting a difference signal between said position reading signal and said reference position signal;

(g) servo amplifier connected to said differential amplifier for amplifying said difference signal of said differential amplifier; and

(h) a servovalve supplying an operating pressure corresponding to said difference signal delivered from said differential amplifier to said first and second hydrostatic pads.

4,193,645

PLAIN BEARINGS

Dennis S. Baker, High Wycombe, and Glyndwr J. Davies, London, both of England, assignors to Glacier Metal Company, Limited, Middlesex, United Kingdom

Continuation of Ser. No. 736,337, Oct. 28, 1976, abandoned, which is a division of Ser. No. 620,754, Oct. 8, 1975, Pat. No. 4,015,949, which is a continuation of Ser. No. 402,334, Oct. 1, 1973, abandoned. This application Oct. 10, 1978, Ser. No. 950,052

Claims priority, application United Kingdom, Jun. 13, 1973, 28054/73; Jul. 4, 1973, 31969/73; Aug. 30, 1973, 40801/73

Int. Cl.[2] **F16C** *9/00*

U.S. Cl. 308—23 **2 Claims**

1. In a plain bearing for use in an internal combustion engine, which is lubricated with a lubricant consisting of an oil, the improvement which comprises a steel backing having adhered thereto a soft bearing layer of an alloy selected from the group consisting of copper/lead, lead/bronze, aluminum/tin and aluminum/silicon, and having adherent on said bearing layer a protective overlay of polyphenylene sulfide.

4,193,646

FLYWHEEL WITH SPRING LOADED BEARING

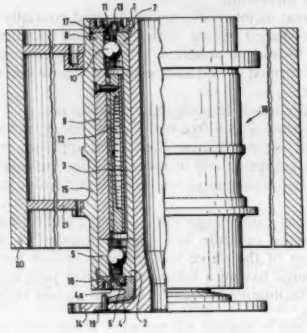
Gerhard Röckl, Gaiberg; Gerhard Nieder, Walldorf, and Hans-Holger Schulz, Neckarsteinach, all of Fed. Rep. of Germany, assignors to Teldix GmbH, Heidelberg, Fed. Rep. of Germany

Filed Nov. 21, 1977, Ser. No. 853,448

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1976, 2652846

Int. Cl.[2] **F16C** *33/80, 35/00, 39/02*

U.S. Cl. 308—187.1 **4 Claims**



1. In a flywheel including a hub sleeve, a stationary core surrounded by the hub sleeve and a bearing unit having first and second ends and including axially spaced first and second rolling-element bearings situated at the first and second ends, respectively, of the bearing unit, each rolling-element bearing having an inner ring supported on the core and an outer ring in engagement with the hub sleeve; an inner spacer sleeve disposed between the inner rings and surrounding the core and an outer spacer sleeve disposed between the outer rings and surrounding the inner spacer sleeve and clamping means axially urging the inner rings against the inner spacer sleeve and the outer rings against the outer spacer sleeve with a predetermined axial force; the improvement comprising a radial terminal flange forming part of said core and being situated adjacent said second end of said bearing unit; and further wherein the improvement in said clamping means comprises

(a) a first clamping arrangement for urging said outer rings against said outer spacer sleeve; said first clamping arrangement including

(1) a first clamping ring threadedly held in an inner face of said hub sleeve at said first end of said bearing unit; said first clamping ring engaging said outer ring of said first rolling-element bearing;

(2) a second clamping ring threadedly held in an inner face of said hub sleeve at said second end of said bearing unit; said second clamping ring engaging said outer ring of said second rolling-element bearing; and

(b) a second clamping arrangement for urging said inner rings against said inner spacer sleeve; said second clamping arrangement including

(1) a third clamping ring threadedly held in an outer face of said core at said first end of said bearing unit; said third clamping ring engaging said inner ring of said first rolling-element bearing;

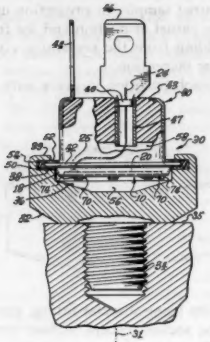
(2) an axially yielding, relatively rigid spring element engaging said terminal flange and a radial face of said inner ring of said second rolling-element bearing; said spring element being substantially unyielding to said predetermined axial force and yielding to axial forces derived from vibrations imparted to said flywheel.

4,193,647

PIEZOELECTRIC CERAMIC TRANSDUCERS WITH UNIFORM RESONANT FREQUENCY

Joe F. Guess, Cedar Rapids, Iowa, and William J. Gastmeier, Stratford, Canada, assignors to Telex Communications, Inc., Minneapolis, Minn.

Filed Sep. 11, 1978, Ser. No. 941,024
Int. Cl.[2] H01L 41/10
U.S. Cl. 310—324 9 Claims



1. Piezoelectric transducer including a diaphragm member having a central circular diaphragm portion carrying a concentrically mounted piezoelectric ceramic sensor, and having a peripheral portion adapted to be rigidly mounted on housing structure with the diaphragm portion and sensor free to vibrate in normal mode at a resonant frequency; characterized in that

the sensor diameter is variable from unit to unit within a predetermined range of diameters,

and said transducer includes means for locally stiffening the diaphragm member with respect to said normal mode of vibration at a limited annular zone which includes and is predominantly limited to the annular zone between the maximum and minimum diameters corresponding to said range of variability of said sensor,

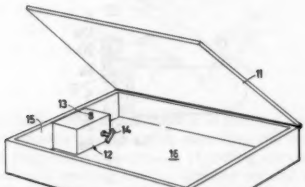
the normal mode resonant frequency of the so stiffened diaphragm portion and sensor being substantially independent of said variations of sensor diameter.

4,193,648

MUSIC-BOX CASING

Antonio Gargiulo, Sorrento (Napoli), Italy

Filed Apr. 21, 1978, Ser. No. 898,881
Claims priority, application Italy, Apr. 22, 1977, 22730 A/77
Int. Cl.[2] A47B 81/06; G10F 1/06
U.S. Cl. 312—9 4 Claims



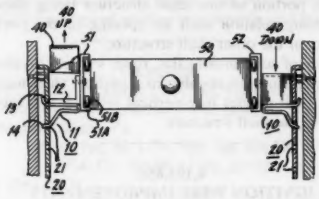
1. A music box casing assembly comprising: a mounting plate adapted to be fixed by fastening members to a vertical supporting surface; and a casing including an L-shaped base plate having a bottom wall for supporting a clock-work, music-producing mechanism and a rear wall, the rear wall and the mounting plate having complementary slidably engaged flanges and guideways such that the base plate is releasably connected to the mounting plate and may be removed therefrom by relative sliding movement, said casing further including a lid forming with the base plate a parallelepipedal box, the lid having holes therethrough for allowing passage of a starter pushbutton and a winding key of a music-producing mechanism and the lid and the base plate having complementary slidably engaged abutments and undercuts such that the lid is releasably connected to the base plate and may be removed therefrom by relative sliding movement.

4,193,649

ANTI-TILT BRACKET AND CLIP ASSEMBLY FOR ADJUSTABLE DRAWERS OR SIMILAR ARTICLES

Zev Sharon, 1447 Kimberly Dr., Lakewood, N.J. 08701

Filed Jan. 22, 1979, Ser. No. 5,603
Int. Cl.[2] A47B 88/00; A47G 29/02
U.S. Cl. 312—346 8 Claims



1. A bracket and clip apparatus for slidable recessed drawers or similar articles comprising in combination:

(a) a surface bracket having a plurality of slots on a surface thereof, said slots separated one from the other by a predetermined distance,

(b) a clip and bracket assembly comprising a bottom portion having a first transverse projection for coacting with any given one of said slots in said bracket, said transverse projection extending from a medial region of said bottom portion with said medial region having a downward arcuate section terminating in a second projection located relatively in the same plane as said first projection to coact with another slot in said bracket with said medial region extending relatively transverse to said bracket when said projections are accommodated by said slots, an upstanding bracket flange rigidly secured to said medial region at a given distance from said first projection and adapted to support a slidable channel assembly,

(c) a counterbalance, member positioned about said upstanding flange and said surface bracket to prevent tilting of said clip and bracket assembly to thereby prevent said projections from inadvertently disengaging from said slots when said bracket flange is supporting a slidable channel assembly.

4,193,650

ADJUSTABLE SHELF DEVICE

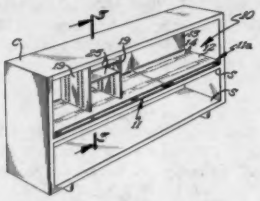
James A. Gray, Edina, and Randall V. Lindfors, Minneapolis, both of Minn., assignors to Zero-Max Industries, Inc., Minneapolis, Minn.

Filed Jul. 19, 1978, Ser. No. 925,949
Int. Cl.[2] A47B 45/00
U.S. Cl. 312—205 7 Claims

1. A longitudinally, adjustable shelf device, comprising:

a pair of elongate shelf structures each including a horizontal shelf member and a vertical shelf member integral with a longitudinal edge of the associated horizontal shelf member and being disposed in substantially right angular relationship thereto, the horizontal and vertical shelf structure

being disposed in overlapped relation respectively with the horizontal and vertical shelf members of the other shelf structure, each of said vertical shelf members having an offset portion extending longitudinally thereof, said offset portion of each vertical shelf member having a plurality of longitudinally spaced apart openings therein, said shelf structure being longitudinally adjustable relative to each other to thereby adjust the overall length thereof,



each shelf structure having a plurality of longitudinally spaced apart openings therein, each opening in the overlapped portion of one shelf structure being disposed in registering relation with an opening in the overlapped portion of the other shelf structure,

a plurality of substantially flat, rigid, vertical dividers each projecting into an opening in a vertical shelf member to orient each divider into vertical relation, and secure the latter to the shelf structure.

4,193,651

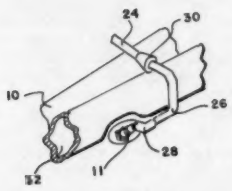
IGNITION WIRE IMPROVEMENTS

Bill J. Hays, 10582 Palladium Ave., Garden Grove, Calif. 92640

Filed Oct. 19, 1978, Ser. No. 952,851

Int. Cl.[2] H01T *13/04*

U.S. Cl. 339—28 **6 Claims**



1. An ignition conductor for an internal combustion engine having hot surface protrudances adjacent to spark plugs which comprises an assembly of a spark plug terminal connector interconnected to a major length of a flexible, insulated, non-self-supporting conductor distally bearing a distributor terminal by a shorter length from 4 to about 16 inches of a malleable, self-supporting, solid core, insulated conductor formed into a self-supporting shape to pass about, in spaced-apart relationship, said hot surfaces.

4,193,652

CARPET SAMPLE DISPLAY CASE

Joseph E. Brown, Jr., Little Rock, Pulaski, Ark. 72202

Filed Jan. 4, 1978, Ser. No. 867,187

Int. Cl.[2] A47B *81/00, 97/00*

U.S. Cl. 312—280 **17 Claims**

1. A carpet sample display case, comprising,

a body that is substantially rectangular in plan, and includes four upstanding walls arranged in two opposed pairs consisting of a pair of opposed side walls, and a front wall paired with a back wall, that define an upwardly open display space among them;

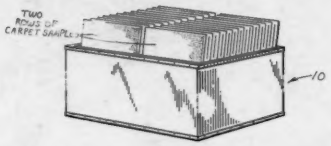
said walls having an upper edge extending perimetrically of the body;

a rectangular rim of reinforcing material mounted upon said upper edge and extending perimetrically of the body;

means securing said reinforcing rim in place upon said upper edge;

a plurality of substantially parallel partitions arranged in a front-to-back series in said display space so as to, with said upstanding walls, divide said space into a front-to-back series of upwardly open compartments, each for receiving at least one carpet sample for projection upwardly therefrom for more casual inspection and for free withdrawal by upward sliding from the respective compartment for more particular inspection;

means securing each partition in place with respect to the body;



the reinforcing rim being a metal fitting, generally of constant transverse section except at four sites where four lengths thereof are joined at respective corners;

the fitting in transverse section having at least one leg in facial confrontation with said four upstanding walls at the upper edge thereof;

the fitting having a second leg in facial confrontation with said four upstanding walls at the upper edge thereof, in opposition to said one leg, said upper edge being received between said one leg and said second leg;

said means securing said reinforcing rim in place upon said upper edge comprising fasteners secured through the respective of said walls and both said legs; and

the same said fasteners also proceeding through means defining ears at opposite ends of each of said partitions and thereby providing said means securing each partition in place.

4,193,653

SOCKET FOR MOUNTING AN ELECTRIC LAMP ON A PRINTED CIRCUIT BOARD

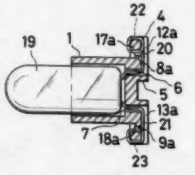
Masanobu Aizawa, Yokohama, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1978, Ser. No. 940,158

Claims priority, application Japan, Jan. 20, 1978, 53-5271[U]; Jan. 20, 1978, 53-5272[U]; Jan. 23, 1978, 53-6603[U]

Int. Cl.[2] H01J *5/50;* **H05K** *1/12*

U.S. Cl. 339—17 D **7 Claims**



1. An electric lamp socket for mounting an electric lamp having a plurality of lead wires on a printed circuit board having electrically conductive sections comprising:

a cylindrical drum having inner and outer walls and first and second ends, said first end defining a socket to receive said electric lamp, said second end comprising a flange portion having opposing front and rear surfaces, said front surface

of said flange portion facing the direction of insertion of said electric lamp into said socket, said flange portion having a plurality of holes therein which extend from said front flange surface to said rear flange surface;

a plurality of first projections on said front flange surface, each first projection being located between two of said holes extending through said front flange; and

a plurality of second projections on the outer wall of said cylindrical drum adapted to secure said printed circuit board between said second projections and said flange portion;

said holes being arranged such that upon insertion of said electric lamp into said socket, each of said plurality of lead wires thereof passes from said front flange surface to said rear flange surface through respective holes of said plurality of holes, said each of said lead wires then running along said rear flange surface and passing through other respective holes leading from said rear flange surface to said front flange surface, said lead wires each then passing over and on said respective first projections on said front flange surface, and then each lead wire being inserted into another of said holes leading from said front flange surface toward said rear flange surface, each of said lead wires then being bent back along said rear surface;

whereby upon mounting said electric lamp socket to said printed circuit board by securing said printed circuit board between said second projections and said flange portion, said lead wires are each forcibly electrically contacted with respective electrically conductive sections of said printed circuit board.

4,193,654

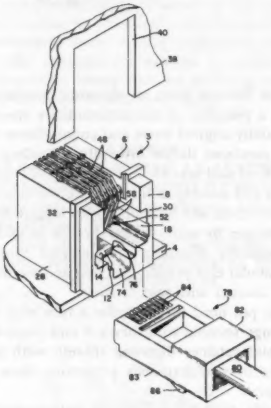
ELECTRICAL CONNECTOR RECEPTACLES

Donald W. K. Hughes, Mechanicsburg, and Ronald W. Myers, Landisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 940,536, Sep. 8, 1978. This application Dec. 7, 1978, Ser. No. 967,441

Int. Cl.[2] H01R *13/54;* **H05K** *1/12*

U.S. Cl. 339—17 LC **7 Claims**



1. An electrical connector receptacle of the type comprising an insulating housing having a plug-receiving end and a rearward end, a plug-receiving opening extending into said plug-receiving end, said opening having opposed internal sidewalls and opposed internal endwalls, said housing having oppositely directed external sidewalls and oppositely directed external endwalls, a plurality of electrical conductors in side-by-side spaced-apart relationship, each of said conductors comprising a contact spring extending from one of said internal sidewalls at a location adjacent to said plug-receiving end diagonally into said opening and towards the opposite internal sidewall, and each conductor having a lead portion extending from said plug-receiving end through said housing between said one internal sidewall and the adjacent external sidewall and towards said rearward end, said plug-receiving opening being dimensioned to receive a connector plug having spaced-apart contact members therein which engage said contact spring portions of said conductors, said connector receptacle being characterized in that:

said adjacent external sidewall and said rearward end have a plurality of side-by-side channels therein, said channels in said rearward end being in alignment with said channels in said adjacent external sidewall, and

each of said conductors comprises a single elongated strip of stamped and formed sheet metal, an intermediate section of said strip being disposed in one of said channels in said adjacent external sidewall, said strip being bent at said rearward end and extending across said rearward end in one of said channels in said rearward end, said strip being reversely bent at said plug-receiving end and having a first end portion extending into said plug-receiving opening, a second end portion of said strip extending beyond the other one of said external sidewalls, said first end portion constituting said contact spring, said intermediate portion and said second end portion constituting said lead portion.

4,193,655

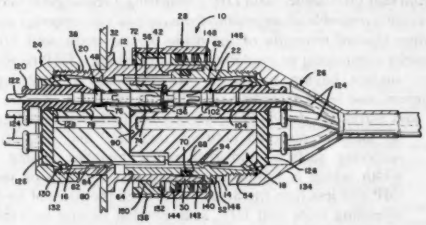
FIELD REPAIRABLE CONNECTOR ASSEMBLY

Henry O. Herrmann, Jr., Mt. Joy, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 20, 1978, Ser. No. 926,581

Int. Cl.[2] H01R *13/04, 23/02*

U.S. Cl. 339—31 R **13 Claims**



7. An environmentally sealed electrical connector member comprising:

a shell member of substantially cylindrical profile adapted to mate with a further shell member, said member having keying means and a profiled axial bore extending therethrough;

an insert member having an external profile adapted to be received within said profiled axial bore and a plurality of terminal receiving passageways extending therethrough, said insert member and said axial bore having polarizing means allowing mounting of said insert member in said axial bore with a member of predetermined orientations;

a like plurality of terminals each received in a respective passageway, each said terminal each having a mating portion, a mounting portion engagable in said passageway, and a conductor engaging portion and

means to environmentally seal the rear end of said shell including a boot member engaging each conductor leading to a respective terminal, a rear gasket engaging a rear portion of said insert and having a planar portion with a plurality of bores, each receiving one of said boots therein in sealing engagement, and an integral annular sleeve portion, and

compressive ring means engagable with the rear end of the shell and adapted to apply pressure to said gasket with said planar portion forming a first seal between said gasket

and each said boot member, a second seal between said gasket and the respective compressive ring and said sleeve portion forming a third seal between said shell and the respective insert received therein;

interfacial seal means providing sealing between face portions of mating inserts; and

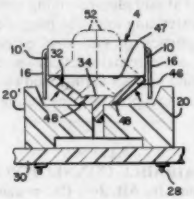
annular sealing means providing sealing between mating shells.

4,193,656

EXTRACTION DEVICE FOR EXTRACTING A DIP FROM A DIP HEADER

John A. Ward, Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 20, 1978, Ser. No. 972,119
Int. Cl.² H01R *13/62*
U.S. Cl. 339—45 M **9 Claims**



5. In combination with a DIP and a DIP header, a molded one-piece plastic extraction device for removing said DIP from said DIP header, said DIP comprising a rectangular body having a row of leads extending from each of two opposite side edges thereof normally of the plane of said body, said DIP header comprising an insulating housing having a DIP receiving surface having two rows of lead-receiving openings therein, said leads extending into said openings,

said extraction device comprising a normally flat rectangular member disposed between said DIP and said DIP receiving surface, said rectangular member having a width which is substantially equal to the width of said DIP and less than the distance between the rows of leads extending from said DIP, said member having movable portions which are arcuately movable away from said surface, said movable portions being symmetrically located with respect to said rows of leads whereby upon arcuate movement of said movable portions away from said DIP receiving surface, said DIP is moved normally of its own plane away from said DIP receiving surface,

said movable portions having projecting portions which extend beyond one end of said DIP and said DIP header, integral actuator lever means on said projecting portions, said actuator lever means being effective upon movement thereof to move said movable portions arcuately away from said DIP receiving surface whereby,

upon manipulation of said levers, said movable portions of said member move away from said DIP receiving surface and said DIP is pushed away from said header.

4,193,657

ELECTRICAL CABLE TERMINATION

Ralph W. Slone, 12615 S. Groveside, La Mirada, Calif. 90638

Filed Jul. 28, 1978, Ser. No. 929,039
Int. Cl.² H01R *13/40, 21/02*
U.S. Cl. 339—63 M **3 Claims**

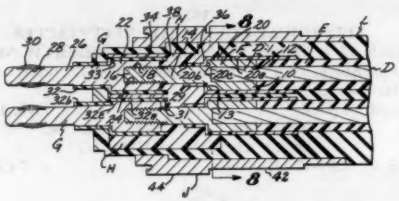
1. In combination with a multi-conductor metallic armored electric cable that has had the metallic armor removed from an end portion thereof to expose a plurality of spaced electrical conductors that are enveloped in separate electrical insulating covers that have end portions thereof removed to expose sections of the bare conductors, a termination for said armored electric cable, said termination including:

a. a plurality of metallic connectors, each of said connectors including a first tubular rearward portion, an elongate first extension projecting forwardly from said rearward portion, said first rearward portion and first extension defining a first body shoulder at their junction, said first extension having external threads on a forward section thereof, and each of said connectors having one of said bare sections of one of said conductors inserted within said first rearward tubular portion and metalically bonded thereto;

b. a plurality of metallic terminals, each of said terminals including an internally threaded second rearward portion, a second elongate extension projecting forwardly from said second portion and defining a second circular body shoulder at the junction therewith;

c. a plurality of first electrical insulating tubular sleeves that are removably mounted on said connectors to envelop a part of said first extensions, all of said first rearward portions, and said first tubular sleeves extending rearwardly over said insulating covers rearwardly of said bared end sections;

d. a plurality of second electrical insulating tubular sleeves that are removably mounted on said terminals to envelop a rearward part of said second extensions and all of said second rearward portions;



e. a retainer formed from an electrical insulating material that has a plurality of circumferentially spaced, parallel sets of axially aligned bores and counterbores therein that at their junctions define inwardly extending abutments, with each of said sets having one of said connectors and terminals and associated first and second sleeves partially disposed therein and held in a fixed longitudinal position in said retainer by said external threads on said first extension threadedly engaging said internal threads in said second tubular end to hold said first and second sleeves in pressure contact with said retainer;

f. a metallic pot head that includes a tube that has a transverse flange secured to a forward end thereof, said tube having said retainer disposed therein with said second extensions of said terminals projecting forwardly from said flange;

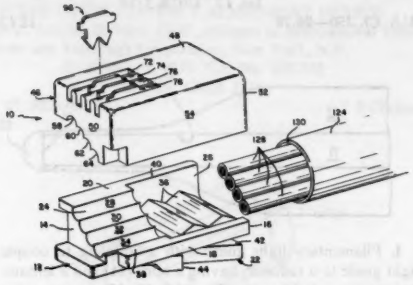
g. a generally cylindrical body of polymerized electrical insulating material that fills said tube and envelops said retainer and first and second sleeves and extends rearwardly to the forward edge of said metallic armor not removed from multi-conductor cable; and

h. replaced metallic armor that envelops said body of electrical insulating material rearwardly of said tube, with said forward end of said replaced metallic armor bonded to a rearward portion of said tube and a rearward portion of said replaced metallic armor bonded to the forward portion of said metallic armor not removed from said multi-conductor metallic armored cable.

4,193,658
MODULAR TELEPHONE PLUG

Larry E. Dittmann; Robert M. Koch, both of Harrisburg; Van K. Webster, Camp Hill, and Edwin T. Harris, Middletown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 27, 1978, Ser. No. 900,468
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—97 P 1 Claim



1. A modular telephone plug formed from two separate components, comprising:

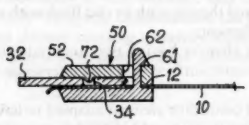
a. a first component, molded from an insulating material, being generally rectangular with one side wall being longer than the opposite side wall, thereby providing an inclined surface, said inclined surface having a plurality of longitudinally extending grooves thereon, and a plurality of slots extending from the grooves to the surface opposite said inclined surface, said slots being adapted to receive insulated wire-piercing terminals therein; and

b. a second component, molded from an insulating material, being generally rectangular with one side wall being longer than the opposite side wall, thereby providing an inclined surface, said inclined surface having a plurality of longitudinally extending grooves thereon, said first and second components being oriented so that upon bonding the two together to form said plug, the inclined surfaces are conformably mated with the respective grooves forming circular passageways adapted to contain telephone wires therein for termination by inserting insulated wire piercing terminals through said slots.

4,193,659
DEVICE FOR CONNECTING AN AUTOMOBILE HEADLAMP TO A PRINTED CIRCUIT

Alain Deverrewaere, La Varenne, France, assignor to Cibie Projecteurs, Bobigny, France

Filed Oct. 4, 1978, Ser. No. 948,562
Claims priority, application France, Oct. 12, 1977, 77 30698
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—17 D 9 Claims

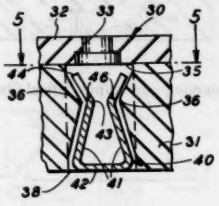


1. A connection device for ensuring the mechanical and electrical connection of an automobile headlamp, comprising at least one flat connecting pin, with a flexible printed supply circuit, comprising, for each pin of the lamp to be connected, a clip constituted by two homologous parts connected by a hinge and adapted to cooperate with each other along a plane of tightening, these two homologous parts comprising on their inner face means for positioning the pin inside the clip, means for retaining the printed circuit inside the clip, means for closing the clip ensuring its tightening so that the printed circuit is applied along the whole length of the pin of the lamp.

4,193,660
ELECTRICAL CONTACT ASSEMBLY

Frank C. Jaconette, Trumbull, Conn., assignor to Harvey Hubbell, Incorporated, Orange, Conn.

Continuation-in-part of Ser. No. 875,212, Feb. 6, 1978, abandoned. This application Dec. 15, 1978, Ser. No. 969,730
Int. Cl.[2] H01R *13/12*
U.S. Cl. 339—191 R 28 Claims



1. A female electrical contact assembly having a contact pocket defined by a sidewall, a front end and a rear end, the front end having an opening therein for receiving a male contact, the pocket having a longitudinal axis and housing a female contact including a base member and at least one elongate contact arm having a rearward portion extending from the base member toward the front end of the pocket, the rearward portion of said contact arm being inclined inwardly from the base member toward said longitudinal axis to provide a region wherein electrical contact is made with the male contact inserted into the opening, a frontward portion of said contact arm diverging outwardly from the region to a position rearwardly of the opening for guiding the tip of the male contact into the region, wherein the improvement comprises; a contact arm abutment mounted on the pocket sidewall and having a part thereof opposite the contact arm and extending inwardly of said frontward portion thereof substantially in said region for restraining outward displacement of said contact arm, said frontward portion of said contact being open to pass said abutment part when the contact arm is inserted into the pocket through the rear end thereof with the frontward contact portion leading the rearward contact portion.

4,193,661
OPTICAL MULTICHANNEL COUPLER

Luigi d'Auria; Jacques Dubos, and Andre Jacques, all of Paris, France, assignors to Thomson-CSF, Paris, France

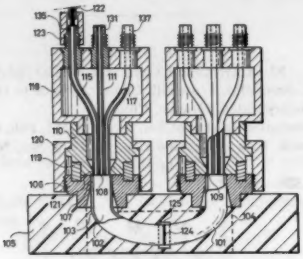
Filed Apr. 24, 1978, Ser. No. 899,587
Claims priority, application France, Apr. 29, 1977, 77 12954
Int. Cl.[2] G02B *5/16*
U.S. Cl. 350—96.16 4 Claims

1. A multichannel coupler for coupling a plurality of input optical fibers to a plurality of output optical fibers, which comprises:

a mixing fiber U-shaped for having its two ends substantially in a same plane, and divided into two parts; a cut substantially perpendicular to the axis of said mixing fiber separating said two parts, and two opposite surfaces ending respectively said two parts delimiting said cut; and at least one of said surfaces being ground with a grain size approximately equal to 9.5 μm;

a ring for holding end-to-end said two opposite surfaces and preventing extraneous foreign bodies from being introduced into said cut;

means for coupling said input optical fibers to one of said parts; and



means for coupling said output optical fibers to the other of said parts.

4,193,662

BROADBAND SWITCHING SYSTEM UTILIZING OPTICAL FIBER WAVEGUIDES

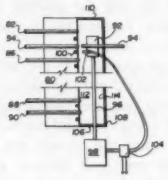
Elmer H. Hara, Ottawa, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jul. 26, 1978, Ser. No. 928,123

Claims priority, application Canada, Aug. 9, 1977, 284353

Int. Cl.[2] G02B 5/14

U.S. Cl. 350—96.15 **13 Claims**



1. An optical-fiber switch for use in switching a plurality of optical signals which are capable of being modulated with a broadband radio frequency signal, said switch comprising:

(a) a plurality of optical-fiber means for feeding respective optical signals to a plurality of fixed positions associated with respective optical-fiber means;

(b) a further optical-fiber means having one end which is movable between a plurality of selective positions adjacent and facing said plurality of fixed positions;

(c) driving means for moving said further optical-fiber means between said plurality of selective positions to selectively feed said optical signals between one of said plurality of optical-fiber means and said further optical-fiber means; and

(d) a plurality of light emitting positioning means each located adjacent a respective one of said plurality of fixed positions, and a light sensitive element adjacent said further optical-fiber means to receive light from said light emitting means, said light sensitive element being associated with said driving means to selectively align said further optical-fiber means with one of said fixed positions associated with respective said light emitting positioning means.

4,193,663

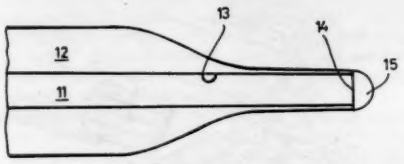
COUPLING-EQUIPPED LIGHT GUIDE

Christian Timmermann, Eschollbrucken, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 853,138, Nov. 21, 1977, Pat. No. 4,137,060, which is a continuation-in-part of Ser. No. 816,892, Jul. 18, 1977, abandoned. This application Nov. 16, 1978, Ser. No. 961,126

Int. Cl.[2] G02B 5/14

U.S. Cl. 350—96.18 **12 Claims**



1. Filamentary light guide with a coupling to couple the light guide to a radiator, having a core (**11**) and a lensatic end comprising a light guide fiber (**11, 12, 13**) having a portion adjacent the end thereof in which the cross section of the light guide fiber is reduced to almost the core (**11**) and leaving an interface (**13**); and, as a separate element, an essentially semi-spherical lens (**15**) attached to the end surface of the light guide fiber, said lens having a cross-section shape adjacent the end of the fiber which is similar to the reduced cross section of the light guide fiber adjacent said end, and being of a material having a lower melting point that that of the filament.

4,193,664

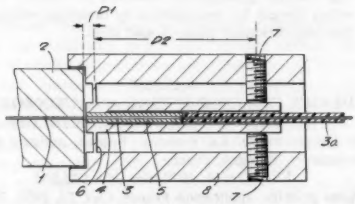
OPTICAL FIBER CONNECTOR

George Ellwood, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 776,785, Mar. 11, 1977, abandoned. This application Jul. 31, 1978, Ser. No. 929,249

Int. Cl.[2] G02B 5/14

U.S. Cl. 350—96.21 **4 Claims**



1. An optical fiber connector assembly comprising:

a first connector element adapted to have an optical fiber mounted therein with its end flush with an end face of said first element;

said first element having two longitudinally extending flats on its outer surface, said flats intersecting so as to define a V;

a second connector element adapted to have an optical fiber mounted therein and having an extension portion projecting toward said first element when said elements are to be mated;

said extension portion having a cut-away part with a V-shaped internally-contained recess so dimensioned as to snugly receive said V defined by said flats on said first element;

said second element also having latch means engaging said first element when said elements are mating with said V

defined by said flats of said first element mounted in the V-shaped recess of said second element; and

fine adjustment means is provided on one of said elements for precisely laterally adjusting the fiber end thereof with respect to the fiber end of the other element.

4,193,665

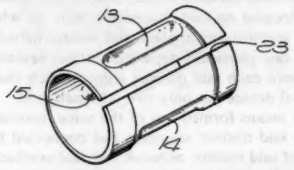
FIBER OPTIC CONTACT ALIGNMENT DEVICE

Bruce K. Arnold, El Toro, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,732

Int. Cl.² G02B *5/16*

U.S. Cl. 350—96.22 **3 Claims**



1. In a fiber optic cable connector, a device for effecting lateral alignment of a pair of abutting generally cylindrical fiber optic cable termination pins in light transmission relationship, comprising:

an elongated, generally tubular, relatively thin-walled, member having a mid-region and two end portions, said mid-region having not more than one longitudinally extending narrow slot therein whereby said mid-region has a substantially continuous perimeter, said end portions being each sized to receive a corresponding one of said pins, said pins being inserted therein and abutting within said mid-region;

termination pin alignment means comprising a plurality of resilient, radially, inwardly formed wall portions within said mid-region of said member defining a restricted bore therein, said wall portions being uniformly circumferentially spaced from each other, the transverse cross-section of said pins in said mid-region being greater than the cross-section of said restricted bore whereby said wall portions deflect radially outwardly when said pins are inserted in said restricted bore, the remaining perimeter of said member at said mid-region thereof being arranged and shaped to assume a position of compensatory deflection upon outward deflection of said wall portions, said inwardly formed wall portions thereby exerting resilient, radially inward forces against said pins, at least at the location of said abutting, causing said pins to be precisely laterally aligned; and

said inwardly formed wall portions being inwardly curved sides of said mid-region of said member, said mid-region being of generally triangular cross-section, the centers of the three sides thereof exerting inwardly directed alignment forces against said pins at least adjacent to said abutting location.

4,193,666

DISPLAY COLLIMATOR SYSTEM INCLUDING A STANDBY RETICLE ARRANGEMENT

Yves Cojan, Paris, France, assignor to Thomson-CSF, Paris, France

Filed May 12, 1978, Ser. No. 905,435

Claims priority, application France, May 17, 1977, 77 15050

Int. Cl.² G02B *27/02*

U.S. Cl. 350—174 **6 Claims**

1. A collimator system for a head-up display comprising: a device for displaying luminous objects on the screen of a cathode-ray tube;

an optical collimator assembly to project an image of said objects to infinity;

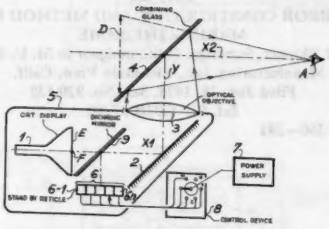
a semi-transparent combining glass to allow the image to be viewed superimposed on the external surroundings; and

a standby reticle arrangement comprising:

at least one reticle disposed laterally to the tube;

dichroic mirror means for transmitting to the optical assembly radiation coming from said screen of said tube and that coming from said standby reticle arrangement;

a power supply for supplying said standby reticle arrangement; and



control means for selectively powering portions of said reticle arrangement to produce a corresponding reticle image which is moveable in a predetermined direction, said reticle arrangement being entirely static, and including a plurality of n elements which are juxaposed corresponding to said direction, said control means comprising a switch device having n positions coupling said supply to said n elements separately, each such element being of one and the same common shape representing a portion of said reticle to be projected, and each position of said switch corresponding to a predetermined position for said moveable image of said reticle in said shift direction.

4,193,667

ZOOM LENS SYSTEM CAPABLE OF CONSTANT MAGNIFICATION PHOTOGRAPHY

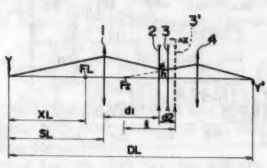
Mitsuo Yasukuni, Sakai; Toshinobu Ogura, Tondabayashi; Takanobu Omaki, Sennan, and Masahide Tanaka, Toyonaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 28, 1978, Ser. No. 937,276

Claims priority, application Japan, Sep. 1, 1977, 52-105764

Int. Cl.² G02B *15/17, 7/10*

U.S. Cl. 350—187 **8 Claims**



1. A zoom lens system capable of constant magnification photography comprising:

a variator lens group for varying the focal length of the lens system by the axial movement;

a compensator lens group for controlling the position of an image formed by the system by axial movement thereof;

first means for connecting the movement of the compensator lens group with that of the variator lens group in a first predetermined relationship so that the position of an

image of a fixed object is maintained within a predetermined depth of focus during the variation of the focal length in a normal zooming mode of operation; and

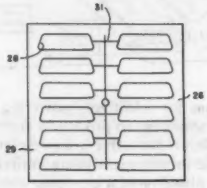
second means for connecting the movement of the compensator lens group with that of the variator lens group in a second predetermined relationship so that the position of an image of a moving object is maintained within a predetermined depth of focus in response to any variation of the focal length to offset any change in magnification due to a change in the photographing distance of the moving object to provide a constant magnification photography mode.

4,193,668

MIRROR CONSTRUCTION AND METHOD FOR MAKING THE SAME

James R. Skinner, Saratoga, Calif., assignor to M. U. Engineering & Manufacturing, Inc., Mountain View, Calif.

Filed Jun. 28, 1978, Ser. No. 920,139
Int. Cl.[2] G02B *17/00*
U.S. Cl. 350—281 **8 Claims**



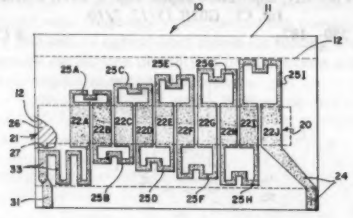
1. In a mirror construction, a transparent member formed of plastic having first and second planar surfaces, first and second transparent laminates formed of plastic film bonded respectively to said first and second surfaces of said member and providing outer plastic surfaces, a reflecting layer formed on one of said outer plastic surfaces and an abrasion resistant coating formed on the other of said outer plastic surfaces.

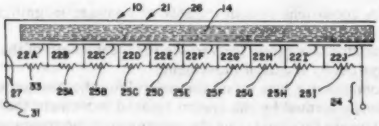
4,193,669

LIQUID CRYSTAL DEVICE FOR DIRECT DISPLAY OF ANALOG INFORMATION

Kenneth J. Richardson, Hudson, Ohio, assignor to Crystaloid Electronics Company, Stow, Ohio

Filed Jun. 29, 1977, Ser. No. 811,308
Int. Cl.[2] G02F *1/13*
U.S. Cl. 350—334 **9 Claims**





1. A liquid crystal device for the display of analog information in images and patterns and whose operational power is furnished by a signal containing the analog information, comprising:

a front and a back transparent plate,

a layer of liquid crystal material sandwiched between said front and back transparent plates,

transparent conducting means applied to selected portions of the side of both said front and back transparent plates adjacent said liquid crystal material including at least two physically separate, distinct segments applied to one said transparent plate and at least one conducting plate applied to the opposite said transparent plate,

means for having a voltage gradient impressed transversely across said transparent plate on which said distinct segments are applied including a resistor network formed out of the same material utilized to form said distinct segments and located on said transparent plate on which said distinct segments are applied, said resistor network having at least one physically separate, distinct resistor interposed between each said distinct segment such that said liquid crystal device has only two terminals, and

resistor means formed out of the same material utilized to form said distinct segments and connected between one end of said resistor network and said conducting plate,

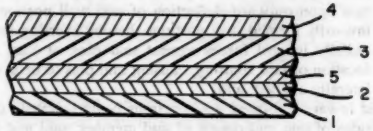
the signal containing the analog information connected to said two terminals, such that the operational power of the device is furnished by the signal containing the analog information.

4,193,670

ELECTROCHROMIC DEVICES HAVING PROTECTIVE INTERLAYERS

Robert D. Giglia, Rye, N.Y., and Richard H. Clasen, West Redding, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 8, 1977, Ser. No. 849,387
Int. Cl.[2] G02F *1/17*
U.S. Cl. 350—357 **18 Claims**



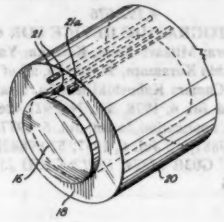
1. In an electrochromic device which comprises an electrode and a counterelectrode and disposed therebetween a layer of persistent electrochromic material and an ion-conductive, electrically insulating layer of polymeric electrolyte material, said layers disposed in said device for reversible ionic conduction across the layers between said electrode and counterelectrode whereby said persistent electrochromic layer is changeable between colored and clear states, the improvement comprising a first electrically insulating film layer of an inorganic compound of thickness in the range from about 100 to 1500 Angstroms, thick enough for electronic insulation, but not so thick as to impair ionic conduction across the thickness of said film, contacting the surface of said layer of electrolyte material nearest said electrochromic layer.

4,193,671

IDENTIFYING MEANS FOR POLYMERIC CONTACT LENSES

Charles E. Erickson, Bellevue, and Amar N. Neogi, Seattle, both of Wash., assignors to Precision Cosmet Corp., Minneapolis, Minn.

Filed Nov. 20, 1978, Ser. No. 962,058
The portion of the term of this patent subsequent to Oct. 24, 1995, has been disclaimed.
Int. Cl.[2] G02C 7/04
U.S. Cl. 351—160 H 11 Claims



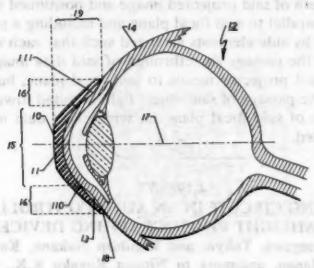
1. A polymeric contact lens blank structure comprising a substantially cylindrical button having at least one identification means positioned therein, said means being compatible with the polymer system forming said button and being machinable along with said button to form a contact lens said means being spaced inwardly from the peripheral edge of said button and extending through the entire thickness thereof in a direction sustantially parallel to its axis.

4,193,672

CONTACT LENS WITH IMPROVED INTERIOR SURFACE

Wayne E. Trombley, and Ronald G. Seger, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Sep. 25, 1978, Ser. No. 945,728
Int. Cl.[2] G02C 7/04
U.S. Cl. 351—160 R 14 Claims



1. A contact lens having an interior surface which comprises:

(a) an optical zone with a radius of curvature substantially equal to the radius of curvature of the cornea of the eye to be fitted at its optical centerline; and

(b) a curved peripheral section extending between the optical zone and the edge of the lens, the peripheral section describing an arc which is tangent to the optical zone at its edge,

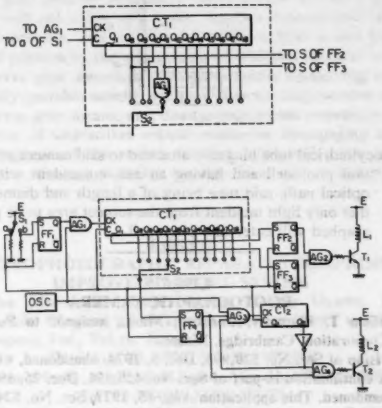
whereby the lens demonstrates central and edge contact on the eye with tearfilm clearance there between and with tearfilm exchange upon blinking.

4,193,673

DIGITAL SHUTTER CONTROL CIRCUIT

Yasuo Ishiguro; Kenji Wakazono, and Toshihisa Saito, all of Tokyo, Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Jun. 7, 1978, Ser. No. 913,348
Claims priority, application Japan, Jun. 10, 1977, 52-67982
Int. Cl.[2] G03B 7/08
U.S. Cl. 354—23 D 6 Claims



1. Digital shutter control circuit for an electric shutter having electrically operable shutter opening means and electrically operable shutter closing means, said digital shutter control circuit including a binary counter circuit having a plurality of output stages each adapted to issue an output signal upon activation thereof by a reference clock pulse generating circuit triggered by release means of said shutter simultaneously with the activation of said shutter opening means, each of said output signals corresponding to the respective one of series of exposure times set in said shutter represented in terms of 2^n where n is an integer, and a selector circuit selectively connectable to selected one of said output stages and connected to said shutter closing means, thereby permitting the desired exposure time selected from said plurality of output signals connected to said selector circuit to be obtained by the activation of said shutter closing means, wherein the improvement comprises an AND circuit having its inputs connected to at least two output stages selected from said plurality of output stages and its output adapted to be selectively connectable to said selector circuit, thereby permitting an intermediate exposure time to be obtained by connecting said output to said selector circuit which exposure time is other than any of said series of exposure times.

4,193,674

MICROFILM CAMERA ATTACHMENT

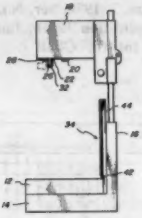
Jeffrey B. Landa, Microfilm Associates Co., Inc., 7101 York Ave. S., Edina, Minn. 55435

Filed Jun. 28, 1978, Ser. No. 919,818
Int. Cl.[2] G03B 7/00
U.S. Cl. 354—59 2 Claims

1. In combination with a camera designed for use with a standard film said camera being of the type having a lens and photocell which opens a shutter until a predetermined quanta of light from the subject area has entered said photocell, said predetermined quanta being nonadjustable; a photocell intake modifying device comprising:

a neutral density filter having an operative position located in the optical path between the subject area and said photocell, said filter being of a density sufficient so that by the

time said predetermined quanta of light has entered said photocell, said shutter has been open long enough so that a film slower than said standard film may be properly exposed; and



a cylindrical tube hingedly attached to said camera adjacent said photocell and having an axis coincident with said optical path, said tube being of a length and diameter so that only light incident from the subject area to be photographed will enter said photocell.

4,193,675

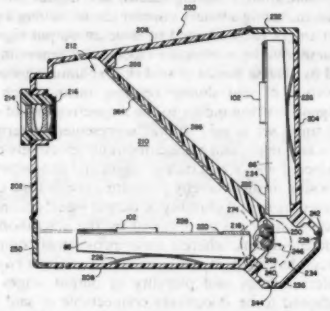
PHOTOGRAPHIC CAMERA

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 529,904, Dec. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 428,454, Dec. 26, 1973, abandoned. This application Aug. 15, 1977, Ser. No. 824,415

Int. Cl.[2] **G03B** *17/52, 19/06*

U.S. Cl. 354—86 **2 Claims**



1. Photographic apparatus of the self-developing type for use with film units requiring an even number of geometrical reversals and with film units requiring an odd number of geometrical reversals to provide a geometrically non-reversed positive image in the film unit, comprising:

means defining first and second chambers for locating film units in position for exposure;

pressure-applying means including at least two juxtaposed members for spreading a processing fluid across a photosensitive layer of the film unit as it is moved therebetween subsequent to exposure;

lens means for geometrically reversing an image of a subject along two orthogonal axes;

optical means for geometrically reversing the image of the subject along only one of said orthogonal axes;

means for changing the relative position of said lens means and said optical means between a first orientation wherein said lens means and said optical means are in optical alignment with each other when the film unit requires an odd number of geometrical reversals and a second orientation wherein said lens means and said optical means are out of optical alignment with each other when the film unit requires an even number of geometrical reversals; and

means for mounting at least one of said juxtaposed members for movement between a first position wherein it cooperates with the other member to receive an exposed film unit therebetween as it is moved away from its exposure position within said first chamber and a second position wherein it cooperates with said other member to receive an exposed film unit therebetween as it is moved away from its exposure position within said second chamber.

4,193,676

DATA PHOTOGRAPHIC DEVICE FOR CAMERA

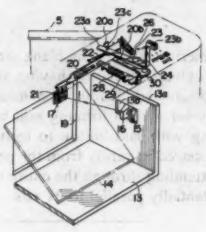
Hiroshi Ueda, Nara; Mitsuru Saito, Kaizuka; Yasuhiro Nanba, Osaka, and Yoshio Kuramoto, Toyonaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 6, 1978, Ser. No. 922,406

Claims priority, application Japan, Jul. 6, 1977, 52-89880[U]; Jul. 6, 1977, 52-89881[U]; Jul. 6, 1977, 52-89882[U]

Int. Cl.[2] **G03B** *17/24, 19/12;* **G05D** *25/00*

U.S. Cl. 354—106 **17 Claims**



1. In a camera including a camera body having a focal plane and an objective lens having an optical axis perpendicular to said focal plane:

means for producing illuminated data;

light projector means for directing and focusing an image of said illuminated data onto said focal plane along an optical axis which is at a predetermined angle to said objective lens optical axis; and

an object light incidence intercepting means intercepting the light path of said projected image and positioned substantially parallel to said focal plane and including a plurality of side by side elements arranged such that each of them allows the passage therethrough of said data image light from said projector means to said focal plane, but intercepts the passage of said object light directed toward that portion of said focal plane on which said data image is projected.

4,193,677

WARNING CIRCUIT IN AN AUTO-CONTROLLED FLASHLIGHT PHOTOGRAPHING DEVICE

Hiroshi Hasegawa, Tokyo, and Kunihiro Nakano, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jul. 28, 1978, Ser. No. 929,040

Claims priority, application Japan, Jul. 29, 1977, 52/101805[U]; May 8, 1978, 53-60787[U]

Int. Cl.[2] **G03B** *15/05, 17/18*

U.S. Cl. 354—127 **4 Claims**

1. A warning circuit in an auto-controlled flashlight device comprising:

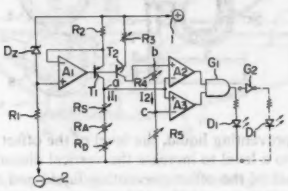
(i) a first circuit including a first variable resistor (R_D) whose resistance value is variable in accordance with the logarithm of the object distance, a second variable resistor (R_A) whose resistance is variable in accordance with the logarithm of the aperture value and a third variable resistor (R_S) whose resistance value is variable in accordance

with the logarithm of the film sensitivity, the first, second and third resistors being connected in series;

(ii) a constant current source (A_1, D_Z, R_1, R_2, T_1) for generating a constant current;

(iii) a junction (a) between said first circuit and said constant current source, at which junction is generated an output voltage corresponding to a guide number determined in accordance with the object distance, aperture value and film sensitivity, when a current from the constant current source flows through said first circuit;

(iv) a second circuit (R_1, D_Z, A_1, R_3, T_2, R_4, R_5) for generating a maximum voltage corresponding to the maximum



value of the quantity of light emitted by the auto-controlled speed light and a minimum voltage corresponding to the minimum value of the quantity of light emitted by the auto-controlled speed light;

(v) Comparator means for comparing the output voltage of said first circuit with said maximum voltage and said minimum voltage and generating a first signal when said output voltage is in the range of said maximum voltage and said minimum voltage value but generating a second signal when said output voltage is beyond said range; and

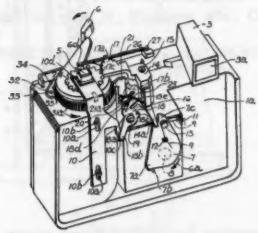
(vi) a light emitting display element turned on in response to the first signal from said comparator means.

4,193,678

SHUTTER STRIKER COCKING MECHANISM

Kwok In Son, Hong Kong, Hong Kong, assignor to W. Haking Enterprises Limited, Hong Kong

Filed Jul. 31, 1978, Ser. No. 929,523
Int. Cl.² G03B *17/42, 9/10*
U.S. Cl. 354—204 **22 Claims**



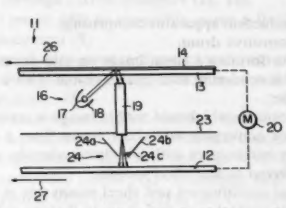
1. In a camera including a shutter member, a striker member adapted to be moved from an initial position to a fully cocked position and then released to strike the shutter member to cause the shutter member to move momentarily away from the lens opening of the camera, a film winding member adapted to communicate a film feeding force to a strip of photographic film, film feeding and striker member cocking means including a manually operable member to be coupled in drive transmitting relation with said film winding member and said striker member, and manually operable striker member release means for releasing said cocked striker member, the improvement in mechanism for interconnecting said manually operable member and said film winding and striker members, said mechanism comprising: drive gear means for moving said striker member from said initial to said fully cocked position during only part of the movement of said manually operable member during a film winding operation, said striker member including a gear segment including a toothed portion provided with teeth meshable with gear teeth of a first portion of said drive gear means to effect the movement of said striker member from said initial to said fully cocked positions and a dead motion portion free of gear teeth so that further movement of said drive gear means will not move said striker member beyond said fully cocked position, said striker member being held in said fully cocked position by the engagement of said gear segment with said drive gear means, transmission means connecting said manually operable member with said film winding member and said drive gear means, and disengaging means responsive to operation of said striker release means for disengaging said gear segment of the striker member from said drive gear means, to release said striker member from said cocked position.

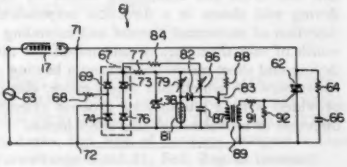
4,193,679

ELECTROPHOTOGRAPHIC APPARATUS COMPRISING IMPROVED IMAGING SYSTEM

Manabu Mochizuki; Kohji Suzuki; Hajime Oyama, and Teruyuki Ohnuma, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 23, 1977, Ser. No. 827,055
Claims priority, application Japan, Aug. 24, 1976, 51-100859
Int. Cl.² G03B *27/00, 27/76*
U.S. Cl. 355—1 **5 Claims**





1. An electrophotographic apparatus comprising in combination:

a photoconductive member;

an original document carrier for supporting an original document;

a light source comprising an illumination lamp for illuminating the document.

an optical fiber array including a row of focussing optical fibers operatively disposed between the document carrier and the photoconductive member for focussing a light image of the document on the photoconductive member;

means for producing relative movement between the document carrier, fiber array and photoconductive member to scan the document;

means defining an exposure aperture between the fiber array

and the photoconductive member, the width of the aperture being sufficiently large that the intensity of the light image is substantially uniform; and

control means for adjusting the intensity of the light source and thereby the intensity of the light image, said control means comprising a triac operatively connected to the lamp and phase control means for adjusting the firing angle of the triac, said phase control means comprising a unijunction transistor operatively connected to the triac and signal producing means for applying a varying electrical signal to the unijunction transistor.

4,193,680

TRANSFER SHEET DRYING DEVICE FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

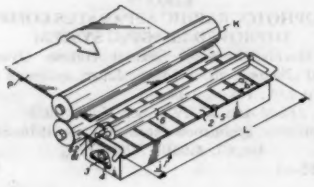
Akira Yoshikawa, and Kouichi Aota, both of Ebina, Japan, assignors to Rank Xerox Limited, London, England

Filed Jun. 28, 1977, Ser. No. 810,812

Claims priority, application Japan, Nov. 16, 1976, 51-152788[U]

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—3 R **3 Claims**



1. Reproduction apparatus comprising:

a photosensitive drum;

means for forming a latent image on said drum;

means for rendering said image visible with a transferable powder;

sheet means to which said visible image is transferred;

means for conveying said sheet means from a sheet means supply into contact with said drum whereby said image is transferred to said sheet means;

means for conditioning said sheet means one at a time prior to their contact with said drum to thereby enhance image transfer thereto; said means for conditioning said sheet means being disposed between said sheet means supply and said drum and comprising means for differentially drying said sheets in a direction perpendicular to the direction of movement thereof and extending across the width of said sheet means, said means for differentially drying said sheet means comprising a heating plate and a roller between which said sheets move, said plate being provided with a plurality of grooves extending in the direction of movement of said sheet means.

4,193,681

LIQUID FEEDING DEVICE

Koichi Tanigawa, and Takayuki Ishihara, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1978, Ser. No. 918,924

Claims priority, application Japan, Jun. 30, 1977, 52-78402

Dec. 29, 1977, 52-160897

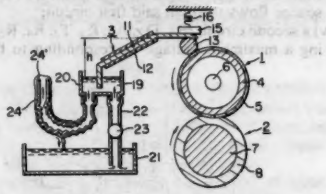
U.S. Cl. 355—3 FU **11 Claims**

1. An image fixing device for fixing a powder image on an image holding member comprising:

first and second rollers at least one of which is heated, said rollers being adapted to grip and transport therebetween an image holding member and fix a powder image held thereon; and

liquid feeding means for feeding offset preventing liquid to said first roller, said liquid feeding means including:

a reservoir for storing the offset preventing liquid, liquid holding means for absorbing the offset preventing liquid within said reservoir through capillary action and holding it, liquid applying means, in contact with said liquid holding means and said first roller, for receiving the offset preventing liquid from said liquid holding means and applying it to said first roller, and liquid level control means for lowering, during a non-feeding period of the



offset preventing liquid, the level of the offset preventing liquid to a level to increase the vertical distance between the level of the offset preventing liquid and the contact position between said liquid holding means and said liquid applying means, and raising the level to a level, during a feeding period of the offset preventing liquid, to reduce said vertical distance.

4,193,682

APPARATUS FOR DEVELOPING LATENT IMAGES OF X-RAYED OBJECTS

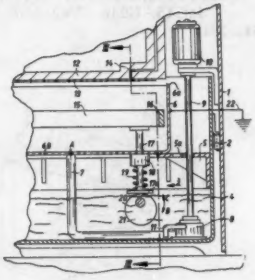
Jürgen Müller, Munich; Josef Pfeifer, Unterhaching; Alfred Rheude, Munich; Rolf Erckel, Munich; Heinrich Färber, Munich, and Bernhard Zrenner, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Jul. 17, 1978, Ser. No. 925,516

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2733072

Int. Cl.[2] G03G *15/10*

U.S. Cl. 355—10 **15 Claims**



1. In an apparatus for treating latent images on receptor sheets with a liquid developer, particularly for developing latent images on dielectric receptor sheets which were exposed to object-modulated X-rays in an ionography imaging chamber, the combination of carrier means for advancing receptor sheets along a predetermined path; a source of liquid developer; a developing electrode adjacent to a portion of said path and having a plurality of channels; means for conveying liquid developer from said source and through said channels toward said portion of said path so that the liquid developer contacts and treats the latent images on receptor sheets advancing along said path to transform the same into developed images; and means for selectively varying the contrast and edge effect of the developed images, including means for moving said elec-

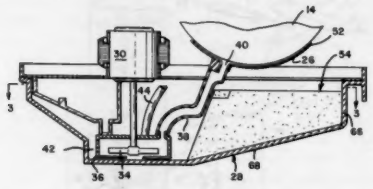
trode in directions toward and away from said portion of said path.

4,193,683

METHOD AND APPARATUS FOR FILTERING DEVELOPING LIQUID IN A PHOTOCOPIER

Fred R. Langner, 12211 N. 82nd St., Scottsdale, Ariz. 85260

Filed Aug. 21, 1978, Ser. No. 935,660
Int. Cl.[2] G03G *15/10*
U.S. Cl. 355—10 **7 Claims**



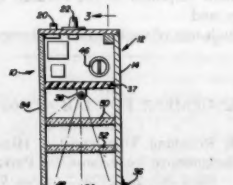
1. A photocopy machine wherein a working fluid is applied to a developing device in a developmental process, the machine comprising a container for receiving the working fluid which has been used in the developmental process; means for pumping the working fluid from the container to the developing device; and a filter trough for removing impurities and gel from the working fluid, said filter trough being disposed within said container in the path of gravity flow of working fluid from the developing device back to the container so that the filter trough collects such returned working fluid, the filter trough comprising an integral body of foamed polyurethane plastic having a generally rectangular horizontal cross-section, an open top, a side wall extending around the trough, a bottom wall and an overflow channel in the top of the side wall, the interior surfaces of the body defining an interior low point located below the upper surface of the working fluid in the container when the photocopy machine is in use, the trough forming a filter including a permeable thick collecting body extending from adjacent the low point upwardly toward the top of the trough for removing impurities and gel from the working fluid, said low point defining a location in the trough for collection of excess gel.

4,193,684

PHOTOGRAPHIC PRINTING AND PRINT IDENTIFYING APPARATUS

Alvin H. Armstrong, 438 W. Pasadena Ave., Clewiston, Fla. 33440

Filed May 12, 1978, Ser. No. 905,553
Int. Cl.[2] G03B *27/52, 17/24*
U.S. Cl. 355—40 **13 Claims**



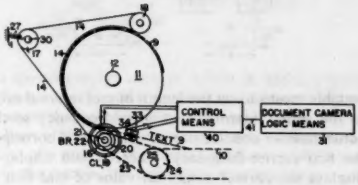
1. Apparatus for marking a photographic medium in a dark room, including a substantially opaque enclosure having an exposure window, a light masking element, holder means connected to the enclosure in operative relation to the exposure window for positioning the light masking element in alignment with the window, and lamp means mounted within said enclosure in spaced relation to the window for projecting a light image through the masking element onto the exposed medium, said holder means including a slotted formation opening on one side of the enclosure for slidably received the masking element, said enclosure including a translucent wall located transversely of said one side.

4,193,685

FIXED MESSAGE CARRIER

Michael W. Rudy, Thousand Oaks; Edward J. Kramer, Canoga Park; Martin M. Bondar, Northridge, and Ronald L. Whitney, Reseda, all of Calif., assignors to Terminal Data Corporation, Woodland Hills, Calif.

Filed Mar. 30, 1979, Ser. No. 25,430
Int. Cl.[2] G03B *27/52*
U.S. Cl. 355—41 **12 Claims**



1. A fixed message carrier apparatus for a document camera system, which system has system-operating logic means (31) and document transport means (10), comprising;

(a) a fixed message carrier transport (11, 14),

(b) control means (40) to reversibly move a fixed message carrier document (9)

from a home position upon said carrier transport toward and away from a photographing position upon said document transport means (10),

(c) position sensor means (33 &/or 34) attached to said fixed message transport and connected to said control means to sense the position of said fixed message document, and

(d) inter-connection means (41) connecting said document camera system logic means (31) to said control means (40)

to enable reversible movement of said fixed message carrier document from said home position toward said photographing position upon command from said system-operating logic means (31).

4,193,686

COUNTING CIRCUIT FOR DETERMINING THE INCOMING FREQUENCY OR RECEIVED CHANNEL IN A HIGH-FREQUENCY SUPERHET RECEIVER

Otto Klank, Arpke, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Fed. Rep. of Germany

Filed Dec. 7, 1977, Ser. No. 858,176
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1976, 2655947
Int. Cl.[2] H04B *1/06*
U.S. Cl. 455—154 **13 Claims**

1. A superheterodyne receiver comprising:

means to receive a desired signal occupying a pre-determined band of frequencies identified by a first carrier frequency;

an intermediate frequency stage comprising fixed-tuned filter means to determine an intermediate frequency band that can pass through said intermediate frequency stage, said band being identified by an actual intermediate carrier frequency;

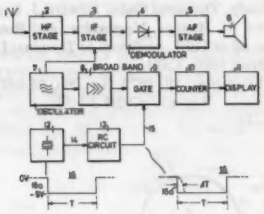
local oscillator means tunable to a frequency that differs from the first carrier frequency by the intermediate carrier

frequency to shift said desired signal from said pre-determined band to said intermediate frequency band;

counter means to count oscillations from said local oscillator for a pre-determined interval of time;

means to modify the count of said counter by a fixed count corresponding to a nominal intermediate carrier frequency;

numerical display means to display the final number counted by said counter means during said intervals; and



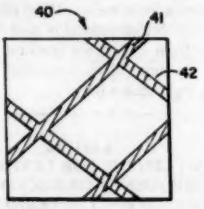
adjustable means to set the length of said interval according to the actual intermediate carrier frequency so that the actual number counted during said interval corresponds to the first carrier frequency, whereby said display means displays the correct numerical value of said first carrier frequency to the degree of accuracy permitted by said final number counted.

4,193,687

HIGH RESOLUTION ALIGNMENT TECHNIQUE AND APPARATUS

John P. Reekstin, Orange; Sigfried G. Plonski, Santa Ana, and Addison B. Jones, Yorba Linda, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 5, 1978, Ser. No. 912,612
Int. Cl.[2] G01B *11/27*
U.S. Cl. 356—150 **11 Claims**



1. Apparatus for high precision alignment of a mask and a substrate in the manufacture of microelectronic devices comprising,

first pattern means comprising a plurality of northogonal lines and spaces which form a first grid,

each of said lines and spaces of said first pattern means having a first prescribed width,

second pattern means comprising a plurality of n−2 orthogonal lines and spaces which form a second grid,

each of said lines and spaces of said second pattern means having a second prescribed width,

one of said first and second pattern means formed on said mask and the other of said first and second pattern means formed on said substrate,

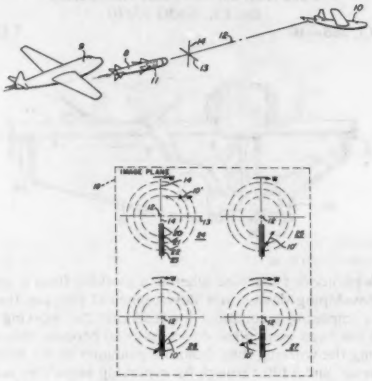
said first and second pattern means adapted to produce moire images as a function of the relative alignment of said first and second pattern means on said mask and substrate.

4,193,688

OPTICAL SCANNING SYSTEM

Robert A. Watkins, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 28, 1970, Ser. No. 84,711
Int. Cl.[2] F41G *7/00*
U.S. Cl. 356—152 **7 Claims**



1. An optical scanning system for determining the angular orientation of a point source of radiating electromagnetic energy relative to the boresight axis of such system, comprising:

(a) an optical arrangement for focusing a portion of the radiating electromagnetic energy into an imaged point on an image plane, the distance of such imaged point from the boresight axis being proportional to the magnitude of the angular orientation of the point source from such axis;

(b) a set of detector elements, each one of such detector elements therein being responsive to the focused electromagnetic energy and being disposed in the image plane along a common axis radial from such boresight axis, each detector element being at a different predetermined distance from the boresight axis;

(c) a scanning mechanism for generating a relative rotation about the boresight axis between the imaged point and each one of the set of detector elements; and

(d) processor means, coupled to each detector element and to the scanning mechanism, adapted to determine the sense and magnitude of the angular orientation of the point source from the boresight axis by determining:

(1) the amount of the relative rotation when a detector element responds to the focused electromagnetic energy; and

(2) which one of such detector elements is responsive.

4,193,689

ARRANGEMENT FOR LOCATING RADIARING SOURCES

Jean-Claude Reymond, and Jean-Luc Hidalgo, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jul. 25, 1978, Ser. No. 927,821
Claims priority, application France, Jul. 29, 1977, 77 23442
Int. Cl.[2] G01B *11/26*
U.S. Cl. 356—152 **7 Claims**

1. A sensor system for the spatial location of radiation sources comprising:

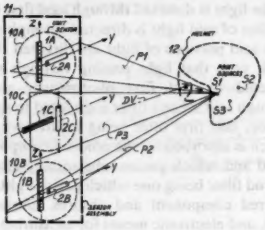
first, second and third unit sensors, each such unit sensor including:

an optical device of the cylindrical lens type for focusing light radiation incoming from a point source defining a plane of reception of said light radiation passing

through said source and the longitudinal optical axis of said optical device, and

a linear array of photosensitive elements for developing detection signals responsive to said light radiation, said elements positioned in the corresponding focal plane of said optical device at an angle with respect to said longitudinal axis,

said first, second and third unit sensors having arrays arranged in a plane, the arrays of said first and second



sensors being aligned in a first cartesian reference direction and the array of said third sensor being oriented in a second cartesian reference direction and situated between said first and second unit sensors,

circuit means for processing said detection signals of said detecting arrays to identify respectively the rank position of the elements activated by said radiation; and

ancillary calculating means for calculating the spatial location of said source common to said planes from the identification.

4,193,690

HETERODYNE DETECTION OF COHERENT RAMAN SIGNALS

Marc D. Levenson; Gary L. Eesley, both of Los Angeles; William M. Tolles, Carmel, and Jin-Joo Song, Whittier, all of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Oct. 19, 1977, Ser. No. 843,611
Int. Cl.[2] G01J *3/44*
U.S. Cl. 356—301 **39 Claims**

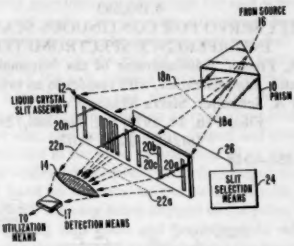
1. In a method for detecting coherent Raman signals from a Raman active sample comprising the steps of irradiating said sample with a radiation output of a pump laser having a frequency w_1, irradiating said sample with a radiation output of a probe laser having a predetermined polarization and a frequency w_2, w_1-w_2 approximately a Raman mode frequency of said sample thereby resulting in a first portion of said probe laser output shifting polarization by 90 degrees as it passes through said sample, directing said probe laser output and said pump laser output into said sample whereby to intersect each other within said sample, filtering said probe laser output after passing through said Raman active sample whereby to pass only radiation having a predetermined polarization, and detecting said passed radiation, the improvement comprising the step of optically heterodyning said first portion of said probe laser output with a second laser output portion thereby obtaining a heterodyned cross-term signal linearly proportional to the Raman cross-section of said sample.

4,193,691

SPECTROMETER

Earl J. Fjarlie, Kingston, Canada, assignor to RCA Corporation, New York, N.Y.

Filed May 2, 1977, Ser. No. 792,676
Int. Cl.[2] G01J *3/28*
U.S. Cl. 356—330 **14 Claims**



1. In a spectrographic analysis system in which a spectrum derived from a sample under test in projected onto a slit assembly, the assembly including slits positioned to pass only those spectral lines of interest in the measurement of the concentration of one of a number of different substances which may be present in the sample, the improvement comprising:

said slit assembly comprising a liquid crystal cell with electrodes at opposite surfaces of the cell for defining the slits in response to voltages applied thereto; and

control means connected to said slit assembly for applying voltages to said electrodes for producing a selected one of a plurality of possible slit patterns, that one pattern being appropriate to the analysis of the particular substance of interest in the sample,

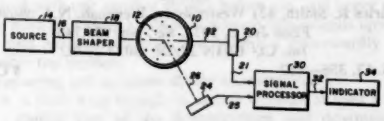
said control means including modulating means for generating a slit modulating signal and for applying said slit modulation signal to a selected group of said slits to generate a modulated selected spectrum for opening the slits at the modulation frequency, and output means including detecting means for detecting said modulated spectrum, and means responsive to said detected modulated spectrum applied as an input thereto for generating said spectrum signal as an output thereof.

4,193,692

METHOD AND APPARATUS FOR THE OPTICAL MEASUREMENT OF THE CONCENTRATION OF A PARTICULATE IN A FLUID

William H. Wynn, Hillsborough, Calif., assignor to Monitek, Inc., Redwood City, Calif.

Filed Jun. 7, 1978, Ser. No. 913,356
Int. Cl.[2] G01N *15/06*
U.S. Cl. 356—341 **5 Claims**



1. The method of measuring the concentration of a particulate in a fluid by optical means utilizing a beam of optical radiation, comprising the steps of:

deriving a first electrical signal "D" commensurate with the optical radiation transmitted through the particulate containing fluid;

deriving a second electrical signal "S" commensurate with the optical radiation scattered by the particulate containing fluid;

deriving a third electrical signal "R" which is equal to the ratio of S/[D+KS], where K is a constant; and

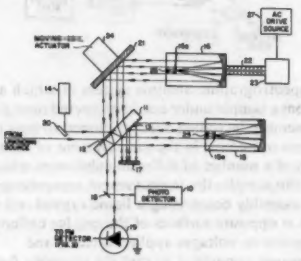
selecting the constant K such that the relationship between C and R is substantially linear, where C is commensurate with the concentration of the particulate contained within the fluid.

4,193,693

VELOCITY SERVO FOR CONTINUOUS SCAN FOURIER INTERFERENCE SPECTROMETER

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Rudolf A. Schindler, Sierra Madre, Calif.

Filed Feb. 24, 1978, Ser. No. 880,729
Int. Cl.[2] G01B 9/02
U.S. Cl. 356—346 **9 Claims**



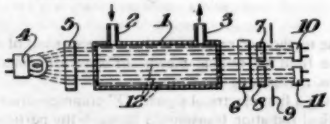
1. In a continuous scan Fourier interference spectrometer of the double-pass type having two cat's-eye retroreflectors and an open-loop, lead-screw drive system for one retroreflector to continuously vary the length of one optical path relative to another optical path through the other retroreflector, the combination comprising a source of a reference beam of known wavelength, said reference beam being directed through said spectrometer, means for detecting the rate of interference fringes of said reference beam as said one retroreflector is driven to vary the length of said one optical path, and for producing an error signal proportional to deviation of said rate with respect to a predetermined rate, and means responsive to said error signal for compensating any deviation of the rate of variation of the path length difference between said one optical path relative to the other optical path from said predetermined rate as said lead-screw drive system continues to vary the length of one optical path relative to the other.

4,193,694

PHOTOSENSITIVE COLOR MONITORING DEVICE AND METHOD OF MEASUREMENT OF CONCENTRATION OF A COLORED COMPONENT IN A FLUID

Charles R. Smith, 421 Westminster, Wenonah, N.J. 08090

Filed Jul. 3, 1978, Ser. No. 921,746
Int. Cl.[2] G01N 21/04; G01J 21/02
U.S. Cl. 356—407 **4 Claims**



1. A device for measuring the concentration of a colored component contained in a flowing fluid comprising:

a. a light source;

b. a first frosted lens;

c. a transparent sample cell containing inlet and outlet ports;

d. a second frosted lens;

e. a first and second filter;

f. a sight mask; and

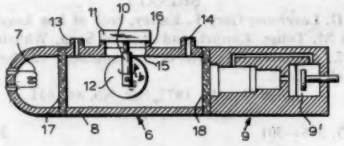
g. a first and second photosensor such that, as said fluid containing said colored component flows through said sample cell, light from said light source is directed through said first frosted lens, then through the sample cell, then through said second frosted lens, then a portion of the light is directed through said first filter and another portion of said light is directed through said second filter, then said portions of light are directed through said sight mask such that light passing through said first filter is directed to said first photosensor and light passing through said second filter is directed to said second photosensor, said first filter being a filter which absorbs light which is absorbed by the colored component being monitored and which passes substantially all other light, said second filter being one which passes light absorbed by said colored component and absorbs substantially all other light, and electronic means for measuring the difference in potential between the outputs of said first and second photosensors, which difference is generated by and is a function of the concentration of said colored component in said fluid.

4,193,695

SPECTROGRAPHIC APPARATUS WITH CHOPPER MEANS LOCATED IN THE SAMPLE CELL

Kennosuke Kojima; Takao Imaki, and Kozo Ishida, all of Miyanohigashi, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Jan. 26, 1978, Ser. No. 872,586
Claims priority, application Japan, Feb. 12, 1977, 52-14471
Int. Cl.[2] G01J 3/48
U.S. Cl. 356—418 **5 Claims**



1. An optical system for a single cell, single beam spectroscopic analyzer comprising a single light source, a single detector positioned to receive light from the light source and a single sample cell connected between the light source and the detector for containing a material to be spectroscopically analyzed and for passing light from the light source therethrough to said detector, said light source, detector and sample cell lying along an axis and having radial dimensions which are substantially the same, said system having no air gap between the light source and the detector, and a chopper means having at least one chopper element in said sample cell, a shaft in said cell on which said chopper element is mounted and extending perpendicularly to the path of light between the light source and the detector, said chopper element having a dimension perpendicular to said axis which is no greater than that of said light source, detector and sample cell, said shaft extending out of said cell, and motor means operatively connected to said shaft for rotating said chopper element around the axis of said shaft, only said motor means being outside the outer periphery of said light source, said detector and said sample cell, said chopper element being in the path of the light between the light source and the detector and having a structure for passing substantially all of the light of at least one frequency from said light source to said detector when it is in one rotational position, and for passing substantially no such light when it is in a

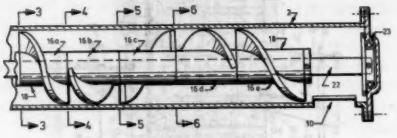
second rotational position about 90° from said first rotational position.

4,193,696

MIXING APPARATUS

Theodore Van Heel, and Henry Van Heel, both of Narre Warren, Australia, assignors to Burgos Pty. Limited, Melbourne, Australia

Filed May 25, 1978, Ser. No. 909,690
Claims priority, application Australia, May 26, 1977, PD0245
Int. Cl.[2] B28C *5/14*
U.S. Cl. 366—66 **4 Claims**



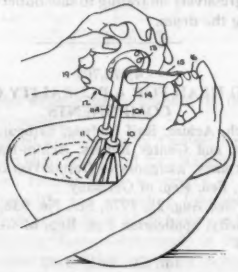
1. Mixing apparatus for mixing pulverent material with a liquid to make concrete, the apparatus comprising a first and a second casing; first mixing means mounted in said first casing for mixing pulverent material; means for interconnecting an outlet of said first casing with an inlet of said second casing so that mixed material can pass from said first casing into said second casing; means for connecting said second casing to a source of liquid; second mixing means mounted in said second casing for mixing a liquid with material passing into said second casing from said first casing thereby making concrete; one of said first and second casings having a cylindrical inner surface and one of said first and said second mixing means comprising a screw member mounted within its respective casing for rotation relative thereto about an axis which is coaxial with the axis of its inner surface, said screw member including a plurality of intercoupled segments, each of said segments having a single axially extending portion defining a flight formed in the shape of 150° to 210° of a full turn of a helical screw having a leading and a tailing portion, the flights being arranged such that the tailing portion of one flight overlaps, as viewed axially, the leading portion of the next succeeding downstream flight by 60° to 120°, so that mixing occurs upon rotation of said screw member.

4,193,697

EGG BEATER

Sam Lebowitz, New York, N.Y., assignor to Copco, Inc., New York, N.Y.

Filed Oct. 18, 1978, Ser. No. 952,459
Int. Cl.[2] A47J *43/10*
U.S. Cl. 366—129 **2 Claims**



1. An egg beater comprising:

A. a manually-cranked drive wheel mounted on an axle and having opposed gear faces;

B. a pair of pinions engaging the gear faces and keyed to hollow shafts supporting intermeshing beater elements, whereby turning of the wheel results in rotation of the elements in opposite directions;

C. a doughnut-shaped housing formed of complementary front and rear half sections encasing said wheel and said pinions and provided with bearings for said wheel axle to support said axle on an axis extending transversely through the center of the housing, said rear half having a bearing into which one end of the axle is journaled, the other end of the axle passing through a journal box projecting laterally from and integral with the front half section and being connected to a crank arm having a knob at its free end, said housing being shaped and dimensioned to be received in the palm of one hand of an operator and having a scalloped periphery to define finger depressions for said hand to function as the beater handle, the rear section of the housing being cupped in the palm, the other hand engaging said knob and cranking said wheel, said axis passing through said palm whereby the beater may be held steady to resist forces seeking to displace it; and

D. a yoke for supporting said beater elements and provided with rods which extend through said hollow shafts and are anchored in said housing.

4,193,698

DEVICE FOR RUPTURING A FRANGIBLE PARTITION BETWEEN SEPARATE CHAMBERS IN A CONTAINER

Veit Gartner, Westendstrasse 19c, D-8202 Bad Aibling, Fed. Rep. of Germany

Continuation of Ser. No. 851,816, Nov. 16, 1977, abandoned.
This application Feb. 7, 1979, Ser. No. 10,269
Int. Cl.[2] B01F *11/00*; B65D *23/04*
U.S. Cl. 366—130 **11 Claims**

1. In combination with a container comprising substantially concentric upper and lower container members which cooperate with a partition member to define upper and lower compartments for separate storage of different materials that are to be mixed with one another shortly before use, said upper container member having a side wall portion that extends upward from said partition member and having a downwardly displaceable top portion,

a rupturing and agitation device characterized by:

A. a shaft long enough to extend through at least a substantial part of the distance from said downwardly displaceable top portion of the container to said partition member, said shaft being slender along its length so as to be spaced radially a substantial distance from said side wall portion of the upper container member, said shaft

(1) having a substantially sharp point at a lower end thereof whereby said partition member can be pierced, and

(2) having an upper end portion cooperable with said downwardly displaceable top portion of the upper

container member to be moved downward by downward displacement thereof; and

B. at least three vanes secured to said shaft near the lower end thereof,

(1) each of said vanes projecting substantially radially from the shaft through at least a substantially major part of said distance to said side wall portion so that the vanes can cooperate with said side wall portion in confining the shaft against substantial tilting out of coaxial relation to the container as the shaft is moved down to pierce the partition member,

(2) said vanes being formed to cooperate with said point on the shaft in rupturing the partition member upon downward axial displacement of the shaft in the container, and

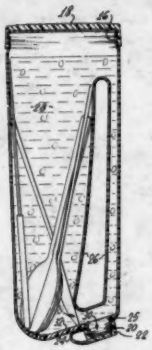
(3) each of said vanes being further formed to impart substantial turbulence to material flowing in directions parallel to the shaft, so that after rupture of the partition member the vanes can serve as baffles which stir and break up the contents of the container when the container is shaken.

4,193,699

WASHER AND CARRIER FOR ELONGATED OBJECTS

Drew O. Haygeman, 704 Silver Spur Rd., Rolling Hills, Calif. 90274, and Robert M. Haygeman, 801 Gwenn St., Springdale, Ark. 72764

Filed Apr. 5, 1978, Ser. No. 893,765
Int. Cl.² B08B 3/04
U.S. Cl. 366—130 **3 Claims**



1. A container for cleaning and storing elongated objects comprising:

a generally cylindrical, elongated, hollow body portion;

a wall means extending generally along the length of said body portion, spaced from the outermost surface of said body portion and cooperating therewith to form a handle, said wall means and the remainder of said body means forming a treatment zone for cleaning and storing said elongated objects;

a first opening at one end of said body portion through which said elongated objects may be inserted into and removed from said treatment zone;

a second opening in the other end of said body portion adjacent said wall means, said second opening cooperating with said wall means to prevent said elongated objects from passing from said treatment zone through said second opening;

means threadably received over said first opening for selectively opening and closing said first opening; and

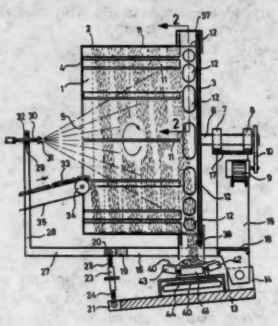
means secured to said body portion for selectively opening and closing said second opening.

4,193,700

CONTINUOUS-FLOW MIXER FOR THE GLUING OF LOOSE CHIPS OF WOOD, FIBERS, OR OTHER PARTICLES

Walter Wirz, Thalwil, Switzerland, assignor to Peter Fahrni, Kilchberg, Switzerland

Filed Jan. 2, 1979, Ser. No. 527
Int. Cl.² B01F 9/06, 15/02
U.S. Cl. 366—156 **8 Claims**



1. A continuous flow mixer for the gluing of loose chips of wood, fibers or other particles which are intended for the manufacture of pressed bodies comprising:

a generally cylindrical hollow drum rotatably mounted around an axis which is oblique with respect to the horizontal, said drum having an inlet end and an outlet end, said inlt end being positioned at a higher level than said outlet end, said drum further including a plurality of driver elements disposed on the inner surface of said drum, said drum further including a header connected to one end thereof;

means for rotating said drum, said means coupled to said header;

means for supplying the particles to be treated to said inlet end;

means for removal of said treated particles from said outlet end; and

a pressure nozzle acting substantially in the direction of the axis of the drum for the spraying of a glue into said hollow drum, said nozzle being disposed adjacent said inlet end and above said particle supply means, whereby when said particles are fed into said rotating drum by said particle conveying means, said particles are conveyed by said driver elements to the upper portion of said drum whereat said particles fall downwardly through the interior of said drum in a veil-like cloud, said particles being sprayed by said glue from said nozzle as they fall, said treated particles progressively migrating to said outlet end preparatory to exiting the drum.

4,193,701

MIXING HEAD FOR A PLURALITY OF FLUID COMPONENTS

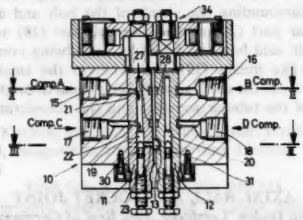
Freidrich Koch, Achim; Ralf Ludwig, Fribourg; Herbert Gunther, Oyten, and Günter Rebers, Achim-Baden, all of Fed. Rep. of Germany, assignors to Desma-Werke GmbH, Achim bei Bremen, Fed. Rep. of Germany

Filed Aug. 25, 1978, Ser. No. 936,658
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1977, 2741554
Int. Cl.² B01F 5/02
U.S. Cl. 366—159 **12 Claims**

12. A fluid component mixing head apparatus, comprising:

(a) a housing block,

(b) a pair of valve spools rotatably disposed side-by-side in parallel bores defined in the block,
(c) two pairs of axially spaced fluid component supply passages defined in the block and respectively communicating with each valve spool bore,
(d) an axial pre-mixing bore defined in each valve spool,
(e) two pairs of radial passages individually defined in each valve spool respectively communicable with the supply passages and extending into the pre-mixing bores,
(f) a final mixing chamber defined in the block and communicating with each valve spool bore,



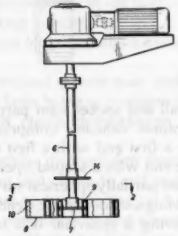
(g) a radial outlet nozzle defined in each valve spool extending into a pre-mixing bore and communicable with the final mixing chamber,
(h) a return passage defined in the block for each of the four fluid components,
(i) a partial circumferential groove defined in each valve spool, surrounding each radial passage, and selectively communicable between each supply passage and each return passage, and
(j) means for rotating the valve spools in unison between fluid component mixing positions and return positions.

4,193,702

JET MIXER AND METHOD

Philip E. Davis, 5451 Appleblossom, Friendswood, Tex. 77546

Filed Sep. 20, 1978, Ser. No. 944,007
Int. Cl.² B01F *13/00, 5/12, 7/00*
U.S. Cl. 366—343 **19 Claims**



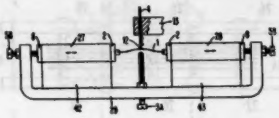
1. A jet impeller mixer-agitator adapted for immersion in a body of fluid comprising:
(1) a shaft adapted for rotation by a power source,
(2) a hub on said shaft connected for rotation therewith, and
(3) at least one tubular blade connected to said hub for rotation therewith, and extending substantially radially from said shaft, said tubular blade having at least one fluid entrance opening facing substantially in the direction of rotation, at least one fluid exit opening facing substantially in a non-direction of rotation, and at least one fluid passage in flow communication with the fluid entrance opening and the fluid exit opening.

4,193,703

MATRIX PRINTER WITH PIEZOELECTRICALLY DRIVEN PRINTING NEEDLES

Walter Sakmann, Herrenberg, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 11, 1978, Ser. No. 868,561
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1977, 2710935
Int. Cl.² B41J *3/10*
U.S. Cl. 400—124 **2 Claims**



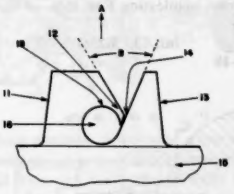
1. In a matrix printer having piezoelectrically driven printing elements, the improvements comprising:
a buckling compression column spring;
at least one piezoelectric crystal arrangement provided with electrical contacts for electrical control of the expansion of said crystal arrangement;
means for coupling the expansion of said crystal arrangement to said spring along the line of the axis of said spring to create a buckling thereof; and
a movable printing element supported adjacent to the central portion of said spring to be deflected therewith when said spring buckles;
said buckling spring being arranged between two piezoelectric crystal arrangements acting at opposite ends thereof.

4,193,704

FASTENER FOR WIRE BOUND MEDIA

Scott Miller, Stratford, Conn.; Thomas Bushman, Dover, Mass.; Kurt Kruger, Monroe, and Kenneth Van Dyck, Westport, both of Conn., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Aug. 21, 1978, Ser. No. 935,208
Int. Cl.² B42F *3/06*
U.S. Cl. 402—19 **21 Claims**



1. A member for removable attachment to a binder comprising
a tab and a backing spaced therefrom;
said tab having a hook which defines an aperture with said backing and is bendable out of the plane of the member for receiving and engaging the binder;
said backing having an edge that extends diagonally tangential from the aperture and defines an open gap terminating in an open notch at the outer edge with respect to said tab for the passage of the binder into said aperture.

4,193,705

SUSPENSION DEVICE

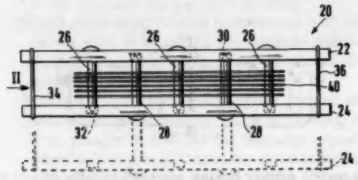
Geoffrey D. Field, 3 Pillans Rd., Rosebank, Cape Town, South Africa

Filed Aug. 29, 1977, Ser. No. 828,669

Claims priority, application South Africa, Aug. 27, 1976, 765163

Int. Cl.² B42F 3/04, 15/06, 13/14

U.S. Cl. 402—46 4 Claims



1. A suspension device for vertical suspension of sheets, such as drawing sheets, which includes

(a) two hollow elongated bars, each bar having a longitudinal slot the sides of which are shaped to retain a block longitudinally slidably inside the bar;

(b) a number of blocks independently slidably provided in each bar;

(c) at least one pin allocated to each block, each pin being connected at one end to its block and the pin passing through the longitudinal slot of the bar in which its block is slidably provided with its opposite free end being directed towards the longitudinal slot of the other bar, each pin being adapted to be inserted through one of a series of holes provided along edges of sheets so that the sheets can suspend from the pins;

(d) locating means provided on each bar for receiving and locating the free ends of the pins of the other bar; and

(e) locking means for releasably holding the two bars in a locked position in which the free ends of the pins are located in the associated locating means.

4,193,706

BOLT CONNECTIONS BETWEEN TUBULAR RODS AND JUNCTIONS IN THREE-DIMENSIONAL FRAMEWORKS

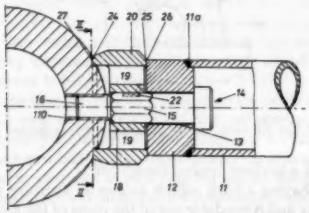
Helmut Eberlein, Wurzburg; Hermann Quenzel, Lengfeld, and Otto Kornberger, Hettstadt, all of Fed. Rep. of Germany, assignors to Mero-Raumstruktur GmbH & Co. Wurzburg, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,611

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1977, 2736635

Int. Cl.² B25G 3/00

U.S. Cl. 403—19 5 Claims



1. In a bolt connection between a tubular rod and a junction of a three-dimensional framework having a threaded bore, wherein a threaded bolt insertable into the threaded bore of the junction is rotatably and axially displaceable within a bore in a connecting element secured to the end of the tubular rod, the head of the bolt being disposed on the side of the connecting element away from the junction and within the tubular rod, and wherein a drive sleeve is disposed and secured between an annular support surface around the threaded bore of the junction and the adjacent end face of the connecting element, the drive sleeve being mounted on the shank of the threaded bolt projecting from the connecting element in an axially displaceable manner but secured against rotation relative to the bolt, the improvement wherein:

the connecting element (12) is cylindrical and the outer diameter thereof corresponds substantially to that of the tubular rod (11), the drive sleeve (17) comprises a hub-part (18) surrounding the shank of the bolt and a felly-like annular part (20) around the hub-part (18) and spaced from it, said hub and felly-like parts being connected by spoke-like means (19), and wherein the smallest outer diameter of the annular part (20) is equal to or greater than that of the tubular rod (11) and the connecting element (12).

4,193,707

AXIAL BALL AND SOCKET JOINT

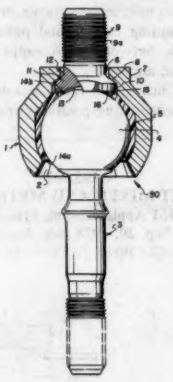
Hans-Jürgen Doden, Lemförde, Fed. Rep. of Germany, assignor to Lemförder Metallwaren AG, Fed. Rep. of Germany

Filed Mar. 31, 1978, Ser. No. 892,071

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1977, 7713390[U]

Int. Cl.² F16C 11/00; F16D 1/12

U.S. Cl. 403—140 4 Claims



1. An axial ball and socket joint particularly for a steering suspension of motor vehicles, comprising a one-piece joint housing having a first end with a first opening therethrough and an opposite end with a second opening therethrough and having an interior partially spherical surface between said first and second openings, a joint pin extending through said first opening and having a spherical ball head portion disposed within said housing, means journalling said ball head for universal pivotal movement in said housing over said spherical surface, said housing having a rim edge around the second opening extending outwardly from said spherical surface with an inturned edge on the interior of the housing adjacent the opening having a partially spherical underface opposite to and spaced from said ball head, a connecting cap screw extending into the interior of said housing through said second opening and having a shank portion fixedly connected to the steering suspension and a head portion larger than said shank portion spaced from said ball head with a spherically curved intermediate segment portion disposed between said head portion and said shank portion and bearing against the spherical underface of said housing, said head portion having an exterior face with

a partial concave spherical recess facing said ball head into which said spherical ball head is engageable, whereby said shank portion once fixedly connected to the steering suspension becomes fixed with respect to said joint housing with the engagement between said spherically curved intermediate segment portion and said spherical underface becoming fixed and preventing stresses in the ball and socket joint due to misalignment of said shank and joint pin and inaccuracies in the abutting surface of the ball and socket joint

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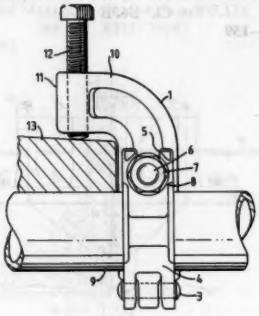
4,193,708

GIRDER CLAMP

Roger M. Kitchen, Sheffield, and Frank Lister, Halifax, both of England, assignors to Deborah Services Limited, Wakefield, England

Filed Sep. 5, 1978, Ser. No. 939,223
Claims priority, application United Kingdom, Sep. 19, 1977, 38960/77; May 22, 1978, 38960/78
Int. Cl.[2] F16B 7/08
U.S. Cl. 403—188 **10 Claims**



1. A fitting adapted to be secured to a length of scaffold tube for clamping said scaffolding tube to the horizontal flange of a flanged girder, said fitting comprising:

a main body, the major length of which extends in the vertical direction,

a clamp pivotally mounted on said main body,

said clamp and main body being so configured as to cooperatively receive and clamp therebetween said length of scaffold tube,

substantially horizontally disposed first fastening means for releasably securing said clamp to said main body,

a portion of said main body extending, at a position remote from the pivotal connection of said clamp, in a direction substantially perpendicular to the major length of said main body,

said main body and clamp being secured to said scaffold tube at a position adjacent an edge portion of said girder flange such that said portion of said main body overlies the upper surface of said horizontal flange of said flanged girder, and

second fastening means operatively cooperable with said main body for engaging said horizontal flange of said girder,

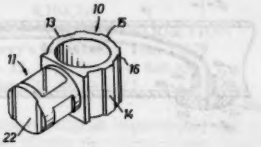
whereby, as said second fastening means is tightened with respect to said main body, said length of scaffold tube and said flanged girder are moved relative to each other so as to be tightly clamped together.

4,193,709

TUBE END FIXTURES

Roger L. Crook, Andover, England, assignor to Martin-Thomas Limited, South Way, England

Filed May 25, 1978, Ser. No. 909,408
Claims priority, application United Kingdom, Jun. 2, 1977, 23412/77
Int. Cl.[2] F16B 7/00
U.S. Cl. 403—191 **6 Claims**



1. A fixture comprising

(a) a first tube engaging portion, and

(b) a second tube engaging portion in the form of a shank integral with said first tube engaging portion

(c) said first tube engaging portion and said shank are formed together as a section of an extrusion

(d) and said shank is of generally circular shape formed by machining a rectangular extruded shape, the axis of the circular shank being at right angles to the axis of the first tube engaging portion.

4,193,710

TRUCK MOUNTED ROLLER

Anthony Pietrowski, 509 Superior St., Genoa, Ohio 43430

Filed Jun. 22, 1978, Ser. No. 918,066
Int. Cl.[2] E01C 19/26
U.S. Cl. 404—128 **2 Claims**

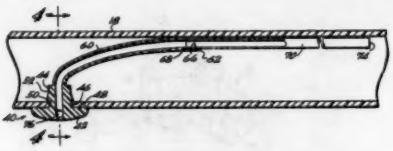
1. A road-rolling machine comprising a truck having front wheels and a front end, a roller support structure attached to said truck at said front end, a cylindrical roller having an axis of rotation with two ends, means connecting said roller to said support structure to rotate about said axis with said axis normally extending transverse said truck, said support structure including means for raising and lowering said roller relative to said truck front end such that said front end is weighted at least partially upon said roller when said roller is lowered and upon said front wheels when said roller is raised, and means for driving said truck when said roller is raised or lowered, said support structure including means for shifting only one end of said axis of said roller relative to said truck front end for steering said truck when said roller is in a lowered position.

4,193,711

FLOW CONTROL VALVE FOR SUBSURFACE IRRIGATION SYSTEM

Sergio Riusech, 2970 NW. 27 St., Miami, Fla. 33142

Filed Jan. 2, 1979, Ser. No. 193
Int. Cl.[2] E02B *13/00*; B02B *1/20*
U.S. Cl. 405—39 **6 Claims**



1. For use in pipes of a subsurface water distribution irrigation system, a valve means to control water flow through downwardly facing, similar sized, longitudinally spaced holes along the pipes,

said valve means comprising:

an integral plastic member including a foot and a leg,

said foot comprising a body having an outer and an inner exterior surface and side faces between the surfaces and said body having a hole extending from the first face toward but not to the second face and a laterally extending port in each side face communicating with the hole,

said inner face being sized to nest in covering relation of one of the holes in the pipe with the hole in the body in registry with one of the holes in the pipe,

said leg being tubular and extending from the body in fluid communication with the body hole, said leg having an upper relatively thick portion of an axial length substantially less than the inside diameter of the pipe and said upper relatively thick portion being connected to the body, and a lower relatively thin portion extending from the relatively thick portion to a terminal end,

the length of said leg being substantially greater than the inside diameter of the pipe, said relatively thin portion being bendable and said leg being sized for insertion into one of the pipe holes, whereby water passing from the interior of the pipe through the leg is adapted to be dispersed laterally through the foot ports,

a seat comprising a sealing means at the juncture of the upper leg portion and the inner foot face to sealingly nest about the margin of one of the pipe holes, and

a preselected tubular length connected to the terminal end of the leg, and

means for interconnecting the tubular length to the leg.

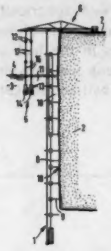
4,193,712

WALL FOR PROTECTING TABULAR ICEBERGS AGAINST THE MECHANICAL EFFECTS OF WAVES

Georges L. Mougin, Paris, France, assignor to ITI Limited, Paris, France

Filed Apr. 24, 1978, Ser. No. 899,252
Claims priority, application France, Apr. 22, 1977, 77 12180
Int. Cl.[2] E02B *1/00*
U.S. Cl. 405—52 **8 Claims**

1. A protective side structure for an iceberg, to provide protection against the mechanical effects of waves and swell, comprising a thermal protective wall for retaining a layer of sea water between it and a side face of the iceberg, and a mechanical protective wall including at least two separate curtains for retaining at least one layer of sea water between it and said thermal protective wall, subject to smaller variations in amplitude than the surrounding sea water outside the protective wall, said mechanical protective wall including ballast located at the bottom edge thereof.

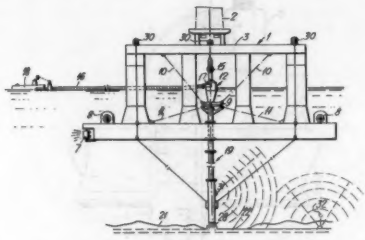


4,193,713

METHOD AND APPARATUS FOR COVERING OR FILLING A TRENCH ON THE SEA BOTTOM

Hadriaan van Nes, Spydeberg, Norway, assignor to A/S Akers Mek. Versted, Oslo, Norway

Filed Jun. 5, 1978, Ser. No. 912,750
Int. Cl.[2] B63B *35/04*
U.S. Cl. 405—159 **4 Claims**



1. A method of covering and filling a trench for an oil and-/or gas conduit on the sea bottom, using a surface vessel which is retained in position over the trench by means of positioning equipment, while filling material is released downwardly towards the trench and sea bottom from the vessel, comprising supplying filling material heavily mixed with water to the surface vessel from a store via a hose, reducing the amount of water with the filling material in a separator aboard the vessel, and conveying the filling material downwardly to the trench and sea bottom via a tube whose mouth is retained adjacent to the trench and sea bottom.

4,193,714

METHOD FOR ERECTING A DECK ON A MARINE STRUCTURE

Trygve Gjerde, Jar, Norway, assignor to A/S Hoyer-Ellefsen; Ing. T. Furuholmen and Ing. F. Selmer A/S, all of Oslo, Norway

Filed Jul. 24, 1978, Ser. No. 927,001
Int. Cl.[2] E02B *17/00*
U.S. Cl. 405—204 **4 Claims**

1. A method for mounting a deck superstructure, comprising at least one concrete girder, on a supporting structure intended to operate in marine surroundings, the supporting structure comprising at least one column extending above sea level, said method comprising the steps of bringing at least one section of the deck superstructure which includes the at least one con-

crete girder into position relative to the column; hoisting the at least one section of the deck superstructure up into a final position by means of cables and a jacking system; and tensioning the cables upon arrival of the at least one section of deck superstructure in the final position thereof, the lower end of the cables being permanently anchored to the at least one concrete girder while the upper ends of the cables is connected

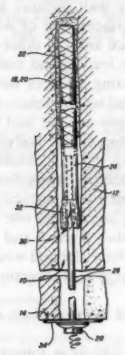
to hoisting and tensioning means arranged on top of the column; the lower part of the cables being arranged within the at least one concrete girder in such a way that the cables, upon tensioning thereof subsequent to the arrival of the at least one section of the deck superstructure at the final position thereof, form an integral part of the static system of the deck superstructure thereby providing both vertical and shear reinforcement.

4,193,715

MINE ROOF SUPPORT METHOD AND APPARATUS

George S. Vass, Summersville, W. Va., assignor to The Eastern Company, Naugatuck, Conn.

Filed May 12, 1978, Ser. No. 905,124
Int. Cl.² E21D *20/02*
U.S. Cl. 405—261 **9 Claims**



1. Apparatus for installation in a drill hole in a rock formation to fracture a resin cartridge and mix the contents thereof, said apparatus thereafter being firmly anchored in the drill hole by the hardened resin mixture and serving to reinforce the rock formation, said apparatus comprising:

(a) an elongated anchor bar;

(b) means carried by one end of said bar, and having an internally threaded portion coaxial with said bar, said bar and said bar-carried means including means limiting the extent to which said bar and bar-carried means may be relatively rotated in one direction;

(c) an elongated bolt having a head at one end and threaded from the other end for a portion of its length for advance into said internally threaded portion of said bar-carried means;

(d) at least one fixed element extending radially outward from said bolt at a predetermined distance from the end of said threaded portion;

(e) a hollow collar having an axial length less than said predetermined distance and greater than the distance from said fixed element to said threaded portion of said bolt, and an axial bore or larger radius than said bolt and smaller than the radial distance by which said fixed member extends outwardly therefrom; and

(f) one of said fixed element and said collar being breakable upon application to said bolt of a predetermined torque for threaded advancement into said internally threaded portion with said collar encircling said bolt between said bar-carried means and said fixed element while said bar is held rotationally stationary.

4,193,716

IMPERMEABLE WALL CONSTRUCTION

Ugo Piccagli, 4511 Harry's La., Dallas, Tex. 75229

Filed Jan. 13, 1978, Ser. No. 869,330
Int. Cl.² E02D *3/12*
U.S. Cl. 405—267 **5 Claims**

1. In a method of constructing an impermeable wall in the ground having no joints therein, the improvement comprising the steps of:

excavating at least one portion of trench in the ground at a width and depth required for the wall,

replacing excavated material from the trench with bentonite-water slurry,

after completing excavation of the one portion of trench, replacing a predetermined amount of the bentonite-water slurry with cement by pumping out the bentonite-water slurry from at least one portion of trench into a mixer where the cement is added and the slurry fed back into the one portion,

mixing the cement with the remaining bentonite-water slurry in the one portion of trench to produde an evenly mixed cement-bentonite-water slurry,

after the cement-bentonite-water slurry has gelled but not hardened, repeating the above steps on further portions of trench adjacent to previously excavated portions of trench until the completed trench is the required length and full of evenly mixed cement-bentonite-water slurry,

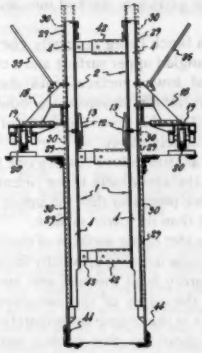
and allowing the cement-bentonite-water slurry to harden and form a single impermeable wall.

4,193,717

SHORING ASSEMBLY FOR A TRENCH OR HOLE

Thomas P. Treacy, 56 Scribers La., Hall Green, Birmingham 28, England

Filed Mar. 6, 1978, Ser. No. 883,938
Claims priority, application United Kingdom, Mar. 5, 1977, 9380/77
Int. Cl.² E02D *19/00*
U.S. Cl. 405—283 **18 Claims**



1. A shoring assembly for supporting the sides of a trench or hole in the ground comprising two vertical shoring sheets engaging with opposite sides of the trench or hole, a respective

substantially vertically extending rack provided on each of said sheets, a respective jack for raising and lowering each sheet, a jacking head of each jack, a base of each jack secured to the respective jacking head, each jacking head being engaged with the respective rack, each base being independently supported on the surface of the ground adjacent to the trench or hole, means holding said sheets apart, a respective guide means provided on each sheet and extending parallel to the respective rack, a respective guide member secured to the respective jacking head and co-operating with the respective guide means whereby each jack is restrained from moving horizontally relative to the respective sheet.

4,193,718

EARTH RETAINING WALL OF VERTICALLY STACKED CHEVRON SHAPED CONCRETE BLOCKS

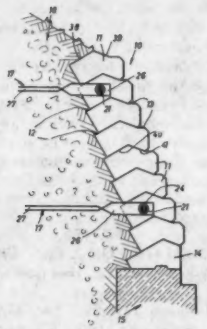
York A. Wahrendorf, Brunswick; Herbert K. Frenzel, Bremen; Adolf K. Ambrosch, Weiterstadt, all of Fed. Rep. of Germany; Knud A. Rasmussen, Roskilde, Denmark; Horst Seibert, Giessen-Wieseck, and Horst J. Dieckmann, Twistringen, both of Fed. Rep. of Germany, assignors to SF-Vollverbundstein-Kooperation GmbH, Bremen, Fed. Rep. of Germany

Filed Jul. 10, 1978, Ser. No. 923,284

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1977, 2731228

Int. Cl.[2] E02D *29/02*

U.S. Cl. 405—286 **2 Claims**



1. A retaining wall for the limitation and containment of sloping earth banks and the like including a plurality of individual moulded blocks of concrete or the like arranged in horizontal courses vertically stacked one above the other, characterized by:

(a) each block being generally chevron-shaped with a convex, angled upper surface and a concave, correspondingly angled lower surface, with the upper surfaces of the blocks in the intermediate courses being matingly received in the lower surfaces of the blocks in a course immediately above,

(b) the opposite sides of each block facing towards and away from the earth bank being oriented in downwardly converging planes so that the upper surface of each block is wider than its lower surface,

(c) the wider upper surfaces of the blocks in each intermediate course defining upwardly facing shoulders that project outwardly both towards and away from the earth bank from the edges of the narrower lower surfaces of the blocks in the course immediately above, and

(d) the shoulders that project outwardly away from the earth bank being defined by generally horizontal surfaces disposed at an inclined angle to the adjacent upper surfaces of the blocks, to thereby provide outwardly extending steps.

4,193,719

CUTTING TOOL

Ronald R. Oaks, North Tonawanda, N.Y., assignor to Niagara Cutter Inc., North Tonawanda, N.Y.

Filed Apr. 17, 1978, Ser. No. 896,738

Int. Cl.[2] B26D *1/12*

U.S. Cl. 407—49 **9 Claims**

1. A cutting tool, comprising:

a body having opposite side faces and a slot therebetween bounded by spaced and facing leading and trailing wall surfaces separated by an intermediate base surface;

a blade arranged in such body slot and having leading and trailing blade surfaces, one of which engages one of said body wall surfaces, said blade having an inner end face opposing said body base surface;

a wedge arranged in said body slot between said blade and the other of said body wall surfaces and having leading and trailing wedge surfaces, one of which engages such other body wall surface and the other of which engages the other of said blade leading and trailing wall surfaces;

the opposed and contacting surfaces between said wedge and blade being inclined so that relative movement therebetween urges said blade toward said body base surface and also toward said one of said body wall surfaces, said opposed and contacting surfaces of said wedge and blade having a first taper inclining away from said body base surface toward said one blade surface and also having a second taper inclining away from one of said body wall surfaces toward the other thereof; and

means provided on said body slot and wedge for preventing movement of said wedge in a direction away from said body base surface.

7. A rotary form-relieved inserted-blade cutting tool, comprising:

a body having opposite side faces joined by a circular peripheral surface and provided with at least one slot extending between such body side faces and opening to such body peripheral surface;

said body slot being bounded by spaced and facing leading and trailing wall surfaces separated by an intermediate base surface;

one of such body wall surfaces having a retaining groove recessed therein extending from one of said body side faces toward the other;

a blade arranged in said body slot and having leading and trailing blade surfaces, one of which engages that one of said body wall surfaces unprovided with said retaining groove;

said blade having a radially inner end face opposing such body base surface;

a cutting edge on said blade arranged radially outwardly of said body peripheral surface and formed by the outer edge of a flat portion on such blade leading surface;

said blade having a radially-relieved peripheral surface on the trailing side of said cutting edge which constantly remains radially outwardly of said body peripheral surface and in cross-section has the same profile as said cutting edge in a plane parallel to said flat portion;

said blade being resharpenable by grinding said flat portion;

spaced raised locating shoulders on one of said blade surfaces and having a spacing therebetween corresponding to the thickness of said body between its said side faces and embracing a proximate portion of said body;

a wedge arranged in said body slot between said blade and that one of said body wall surfaces provided with said retaining groove and having leading and trailing wedge surfaces, one of which engages such one of said body wall surfaces and the other of which engages the opposing one of said blade surfaces;

said wedge having a retaining lug received in said retaining groove to prevent movement of said wedge radially outwardly;

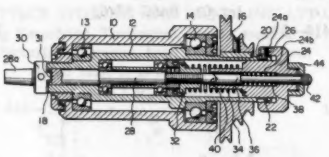
the opposed and contacting surfaces of said wedge and said blade being tapered so that relative movement therebetween urges said blade radially inwardly and also circumferentially toward that one of said body wall surfaces unprovided with said retaining groove, said opposed and contacting surfaces between said wedge and blade lying in a plane inclined both radially and axially of the cutter, such radial inclination being away from said body base surface toward that one of said blade surfaces which engages that one of said body wall surfaces unprovided with said retaining groove, and such axial inclination being away from one of said body wall surfaces toward the other thereof.

4,193,720

CRITICAL TORQUE DETECTOR

Kenji Machida, 2-12 Miyamoto-Cho, Itabashi-ku, Tokyo, Japan

Filed Aug. 15, 1977, Ser. No. 824,655
Int. Cl.[2] B23B *47/24*
U.S. Cl. 408—11 **1 Claim**



1. An apparatus for detecting the critical torque imposed on a rotating drill, comprising:

a rotating input member,

an output member for supporting said drill and connected in a flexible driving connection with said rotating input member, and

means for detecting the difference in rotational speed between said input and output members, when said drill is subjected to a torque greater than the predetermined critical torque,

said rotating input member including;

a rotating sleeve having a pulley keyed thereon,

a plug member inserted in said sleeve and connected by a pin selectively engaging with said sleeve, and

a coil spring connecting said sleeve with said output member,

said output member including;

a spindle for supporting a drill at its forward end, said spindle having a socket member fixed thereon and connected by said spring with said rotating sleeve, and cam surfaces at its rear end, and

said detecting means including;

a reaction rod which is disposed within said plug member so as to be movable longitudinally and rotatable conjointly with said plug member, and is urged toward said output spindle to engage with said cam surfaces of said spindle, and

switch means located adjacent to one end of said reaction rod so as to be contacted by said reaction rod when moved longitudinally.

4,193,721

ARBOR FOR ANNULAR HOLE CUTTER

Everett D. Hougen, G-5072 Corunna, Flint, Mich. 48504

Continuation-in-part of Ser. No. 962,952, Nov. 22, 1978, abandoned. This application Jan. 18, 1979, Ser. No. 4,330
Int. Cl.[2] B23B *47/00, 51/04*
U.S. Cl. 408—68 **19 Claims**

1. In an arbor for an annular cutter of the type having means at its upper end for mounting the arbor on a rotary driven spindle and means at its lower end for mounting an annular cutter thereon, said arbor having an axial bore therein extending to the lower end thereof, a pointed pilot pin slideable axially in said bore and adapted to extend outwardly from the lower end of the arbor so that its pointed end projects axially beyond the lower end of the cutter, a compression spring in said bore biasing the pilot pin axially to said projected position, the pilot pin being retracted axially inwardly in said bore in response to the cutter penetrating into a workpiece to compress the spring and thereby increase the biasing force thereof on the pilot pin, that improvement which comprises, a resiliently deformable plastic sleeve movable axially in said bore with said pilot pin under the bias of said spring, means for expanding said plastic sleeve radially outwardly into tight frictional engagement with said bore for opposing to a high degree the biasing force of said spring on the pilot pin whereby said frictional engagement prevents the spring from expanding freely when the leading edge of the cutter penetrates through the bottom face of the workpiece.

4,193,722

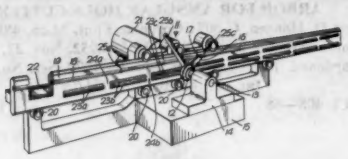
MACHINE FOR MANUFACTURING VARIABLE RATIO RACKS

Arthur E. Bishop, 17 Burton St., Mosman, N. S. W. 2088, Australia

Filed Feb. 27, 1978, Ser. No. 881,911
Claims priority, application Australia, Feb. 28, 1977, PC9216
Int. Cl.[2] B23D *37/06*; B23F *1/08*
U.S. Cl. 409—59 **3 Claims**

1. A machine for manufacturing variable ratio steering gear racks having teeth in two groups arranged symmetrically about a central point on the rack, said machine comprising a base, a holding fixture to hold at least one rack blank having a longitudinal axis and indexable about a second axis passing at right angles to the longitudinal axis of the rack blank through said central point of a rack blank held in said fixture, a broach carrying member, a plurality of pairs of broach blades spaced apart at length along said broach carrying member, means for producing relative movement between said broach carrying

member and said holding fixture, said pairs of blades being arranged to cut sequentially pairs of corresponding teeth of said groups of teeth simultaneously on the occurrence of said relative movement, means to hold said holding fixture correctly indexed during the cutting of teeth, means to index said holding fixture about said second axis after each pair of corresponding teeth has been cut preparatory to the cutting of a succeeding pair of teeth.



4,193,723

TEMPLATE CUTTING DEVICE

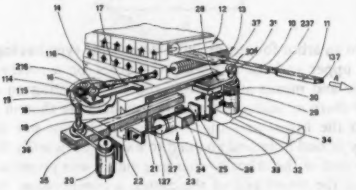
Renzo Novello, Manzano, and Elvio Bottussi, Medeuzza, both of Italy, assignors to Fratelli Novello S.p.A., Manzano, Italy

Filed Sep. 15, 1977, Ser. No. 833,681

Claims priority, application Italy, Sep. 22, 1976, 83444 A/76

Int. Cl.[2] B23C *1/18*

U.S. Cl. 409—122 **7 Claims**



1. A template cutting device for transferring onto a template the lateral profile of an elongated shaped sample piece, comprising:

frame means;

a sensing device on said frame means including a support member supported for movement toward and away from said lateral profile on said sample piece;

drive means on said frame means directly operatively drivingly engaging said sample piece to effect a movement of said sample piece relative to said frame means and substantially perpendicularly to the path of movement of said sensing device, said sensing device including a contour following member mounted on said support member and engaging said lateral profile of said sample piece;

support means supporting said template for rotatable movement about a fixedly located axis in correspondence to the movement of said sample piece; and

cutting tool means mounted on said support member and movable therewith in cutting relationship with a lateral edge of said template,

whereby the movement of said sample piece controls the movement of said cutting tool means.

4,193,724

TORSIONAL VIBRATION DAMPENER

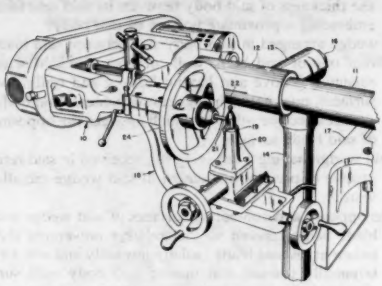
Glenn B. Morse, 328 Morris Ave., SE., Grand Rapids, Mich. 49503

Filed Dec. 26, 1978, Ser. No. 972,957

Int. Cl.[2] B23Q *5/22*

U.S. Cl. 409—141 **8 Claims**

1. In combination with a machine having a frame and a spindle assembly rotatably mounted in said frame, said spindle assembly including a chuck, a torsional vibration dampener comprising:



flywheel means mounted on said chuck for at least limited relative rotation with respect thereto and with respect to said machine about the axis of rotation of said spindle assembly.

4,193,725

STACKING DEVICE FOR ROD-LIKE OR BOARD-SHAPED GOODS

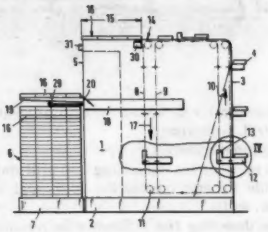
Heinz Schiepe, and Ulrich Pfeiffer, both of Berlin, Fed. Rep. of Germany, assignors to Firma Heinz Schiepe, Grosshandel und Generalvertretung fur Holzbearbeitungsmaschinen, Berlin, Fed. Rep. of Germany

Filed Jul. 24, 1978, Ser. No. 927,508

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2735469

Int. Cl.[2] B65G *57/02*

U.S. Cl. 414—83 **7 Claims**



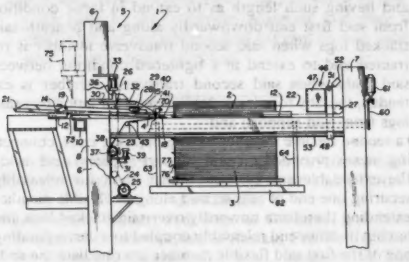
1. A stacking device for rod- or board-shaped products, comprising: stacking carts; upright stands with a rear side; said stacking carts traveling vertically on said upright stands and having horizontally traveling support arms mounted thereon parallel-guided engaging members; storage area means; said engaging members having fixed stop means and receiving said products at the rear side of said upright stands below the level of the storage area, then elevating them to said level and pushing said products onto said storage area, said storage area being located on top of said upright stands and extending by the width of a stacked row beyond a distance traversed by said fixed stop means on top side of said upright stands; said stacking carts, with said support arms retracted and projecting over an upper edge of said stacking carts, being vertically movable underneath said storage area means for lifting a stacked row of said products; the support arms are then extended and said stacking carts are lowerable with said stacked row so that said stacked row may be deposited on a stack by retraction of said support arms.

4,193,726

APPARATUS FOR HANDLING OF FLAT GOODS

Ernst Spengler, Heusenstam by Frankfurt, Fed. Rep. of Germany, assignor to Stanztechnik GmbH R & S, Frankfurt, Fed. Rep. of Germany

Filed Jun. 1, 1978, Ser. No. 911,337
Int. Cl.[2] B65G *59/02*
U.S. Cl. 414—114 8 Claims



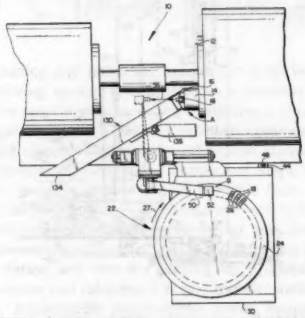
1. An apparatus for handling portions of a stack of sheet or panel goods, comprising machine frame means, carrier means, means supporting said carrier means for horizontal movement in said machine frame means, stack support means operatively arranged relative to said machine frame means for cooperation with said carrier means, and cover means arranged for cooperation with said carrier means in such a manner that upon moving said carrier means into said stack, part of said cover means that is in contact with the portion of said stack, that is being separated from the stack, is stationary relative thereto.

4,193,727

WORKPIECE STORING AND HANDLING APPARATUS

Wolfgang Kesselring, Torrington, Conn., assignor to Jamieson Manufacturing Company, Inc., Torrington, Conn.

Filed Mar. 2, 1978, Ser. No. 882,947
Int. Cl.[2] B65G *47/90*
U.S. Cl. 414—223 19 Claims



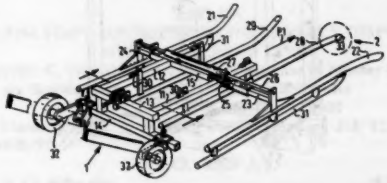
1. A workpiece storing and handling apparatus adapted for use with a multiple work holder machine wherein the work holders are indexible successively in a first substantially vertical planar path through a plurality of stations at least one of which is a machining station and at least one of which is a transfer station, and wherein the work holders have alternative hold and release conditions for transferring a workpiece; said workpiece storing and handling apparatus comprising a magazine having a plurality of workpiece receivers for storing a plurality of like workpieces, means for indexing the magazine to successively move said receivers through a plurality of stations in a second substantially horizontal planar path displaced approximately 90 degrees from the planar path of said machine work holders, at least one of said receiver stations being a workpiece transfer station, a workpiece transfer arm having a free end portion swingable through an arc between a first transfer position adjacent said receiver transfer station and an intermediate ready position spaced from said work station and an intermediate ready position spaced from said work holder transfer station but in alignment therewith for linear movement toward and away from a second transfer position adjacent the station, a workpiece gripper at the free end portion of said transfer arm operable selectively to grip and release a workpiece for transport between said two transfer stations and for transfer thereat, and cooperative motion transmitting and power operating means operatively associated with an opposite end portion of said transfer arm, said motion transmitting means being operable by said power operating means to rotate said transfer arm about two discrete and angularly displaced axes in movement of its free end portion between said first transfer position and said ready position whereby said gripper at said free end portion of said arm is so oriented at said first transfer position as to face the plane of movement of the workpiece receiver stations and so oriented at said ready position as to face the plane of movement of said work holders, and said motion transmitting means being further operable by said power operating means to effect precise substantially horizontal linear movement of said free end portion of said arm and gripper between said ready position and said second transfer position adjacent said work holder transfer station, the orientation of said transfer arm fee end portion and gripper being fixed between said ready position and said second transfer position.

4,193,728

COLLECTING GROUPS FOR STRAW BALES AND LIFTING SAID GROUPS

Cornelis J. Steketee, 11, Korteweg, Driewegen, Netherlands

Filed Oct. 25, 1977, Ser. No. 845,218
Claims priority, application Netherlands, Nov. 10, 1976, 7612502
Int. Cl.[2] B60P *3/00*
U.S. Cl. 414—460 5 Claims



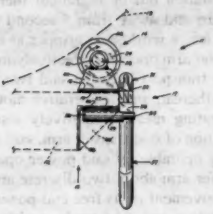
1. In a vehicle for picking up bales, a device for collecting groups of bales, comprising a horizontal frame and gripping members depending from said frame for gripping the bales, the gripping members being formed by a plurality of generally horizontally rod-shaped elements disposed in spaced, parallel relation to one another and the members being movable towards and away from one another in a direction transverse of the direction of the rods, means for driving at least one outermost gripping member in said transverse direction, and at least that intermediate gripping member adjacent the movable outermost member being pivotally mounted on the frame so as to be swingable inwardly and stop means for limiting outward return movement of said intermediate gripping member to a substantially vertical position.

4,193,729

ROLLER ATTACHMENT FOR A VEHICLE

Robert J. Winfield, R.R. #2, Davenport, Iowa 52804

Filed Jun. 26, 1978, Ser. No. 919,014
Int. Cl.[2] B65F 3/14
U.S. Cl. 414—532 6 Claims



1. A roller attachment for a vehicle bed, said attachment comprising:

roller means for loading and unloading the bed;

support means having a reinforcement member; and

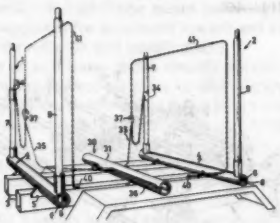
clamp means for selectively altering and locking the disposition of said roller means and said support means, said roller means being attached to said clamp means, said support means being pivotally attached to said clamp means, said clamp means being operable to increase the distance between said roller means and said support means thereby to effect disengagement from the bed, said clamp means being operable to decrease the distance between said roller means and said support means, the bed being disposed between said roller means and said support means, to effect engagement with, and locking onto, the bed.

4,193,730

DEVICE FOR TRANSPORT AND UNLOADING OF STACKED LOGS

Bengt A. Nordin, S-880 52 Hoting, Sweden

Filed Jun. 30, 1978, Ser. No. 920,996
Int. Cl.[2] B60P 1/48
U.S. Cl. 414—537 9 Claims



1. A device for transport of logs and the like, stacked on a support such as a timber truck, and for unloading said logs, said device comprising:

(a) at least two timber bunks secured to said support transversely of same and longitudinally spaced from each other, each of said timber bunks including a first and a second vertically upstanding stake for retaining said stacked logs and a transverse member interconnecting the bottom ends of said stakes, said transverse member being telescopically extendable to move said second stake away from said first stake and simultaneously swing said second stake from its vertically upstanding position to a downwardly inclined position;

(b) a second transverse member secured to said support intermediate said timber bunks and parallel thereto, said second transverse member being extendable in the same direction as the transverse members of said timber bunks, an elongate flexible member having opposite ends, one end of said elongate flexible member being anchored to each of said first stakes at a distance upwards from said support, and the other end thereof being connected to said second transverse member for substantially horizontal movement upon extension and retraction thereof, said flexible member having loose and tightened conditions and having such length as to extend in loose condition from said first end downwardly along and beneath said stacked logs when said second transverse member is retracted and to extend in a tightened condition between said ends when said second transverse member is extended, thereby forming a sloping ramp for unloading said logs from said support; and

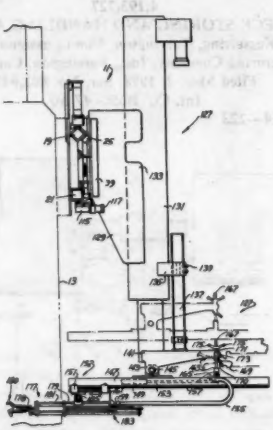
(c) a second flexible member having opposite ends, connecting means provided on said support adjacent and inside the extendable end of each timber bunk for releasably securing one end of said second elongate flexible member extending therefrom upwardly over said stacked logs and having its other end releasably coupled to a corresponding one of the first said flexible member intermediate the ends thereof, so that said second flexible member can be tightened around said stacked logs by partial extension of said second transverse member.

4,193,731

ADJUSTABLE SHUTTLE MOUNT FOR PRESSES

John A. Blatt, Grosse Pte. Woods, and Gordon J. Fox, Mt. Clemens, both of Mich., assignors to Leland Francis Blatt, Grosse Point Shores, Mich.

Filed Jun. 28, 1978, Ser. No. 919,820
Int. Cl.[2] B25J 9/00; B65G 47/90
U.S. Cl. 414—589 7 Claims



1. A horizontally adjustable shuttle mount comprising a main frame adapted for mounting upon and transversely of the column of a press having a bed and used in the manufacture of automotive, truck or refrigerator panels;

said frame including a pair of horizontal, vertically spaced tubes of square cross section, the upper tube having a pair of top walls inclined at 45 degrees with the vertical;

the lower tube having an upright side wall;

an upright carriage plate spanning said tubes and adapted to mount an automation unit for loading blanks and unloading pressed panels from the bed of said press;

a pair of longitudinally spaced bearing blocks mounted adjacent the upper end of said carriage plate;

a pair of 90 degree related cam roller followers journalled

upon each bearing block upon axes inclined at 45 degrees to the vertical supportably bearing upon said upper tube top walls;

a pair of longitudinally spaced bearing blocks mounted adjacent the lower end of said carriage plate;

a cam roller follower journalled upon each latter bearing block upon a vertical axis and operatively engaging said lower tube side wall;

and power means on said frame and connected to said carriage plate for longitudinally adjusting said plate along said frame for pre-locating said automation unit upon and with respect to the press bed.

4,193,732

LOADING AND UNLOADING STATION FOR CONVEYORS WITH SUSPENDED TROLLEY DRIVING SYSTEMS

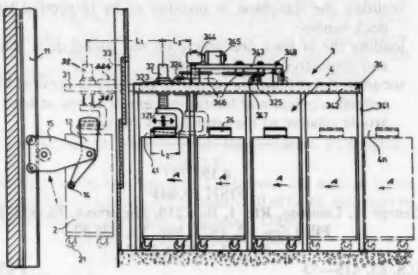
Klaus Vetter, Rastatt, Fed. Rep. of Germany, and Hermann Baudendistel, deceased, late of Rastatt, Fed. Rep. of Germany (by Rosemarie Baudendistel, heir), assignors to Stierlen-Maquet Aktiengesellschaft, Rastatt, Fed. Rep. of Germany

Filed Jan. 31, 1977, Ser. No. 764,086

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1976, 2603303

Int. Cl.[2] **B66F** *9/08;* **E04H** *6/06*

U.S. Cl. 414—609 **7 Claims**



1. A loading and unloading station for a conveyor with a trolley driving system which includes a plurality of deposit stations for respectively receiving containers, a transfer station having gate means operable to establish communication between said transfer station and said deposit stations, carriage means movable in said transfer station and adapted to receive and carry a container, and a grab movable from one of said deposit stations to said transfer station and vice versa, said grab additionally being movable vertically for selectively picking up a container at said transfer station and releasing it at said one deposit station and also for picking up a container at said deposit station and releasing it at said transfer station onto said carriage, horizontally displaceable means operatively connected to said grab for moving the latter from a deposit station next to said transfer station to said transfer station and vice versa, a chain drive operatively connected to said horizontally displaceable means for displacing the latter, rail means for guiding said grab along a horizontal path from said transfer station to the nearest deposit station and vice versa, and in which said chain drive includes: two rotatable sprocket wheels stationarily journalled and arranged in spaced relationship to each other, a chain looped around said sprocked wheels, a coulisse connected to said horizontally displaceable means, and a follower connected to said chain and movable in a direction transverse to said horizontal path of said grab, said coulisse being connected to said horizontally displaceable means.

4,193,733

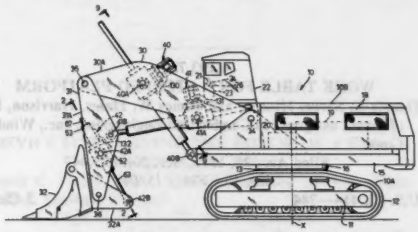
HYDRAULIC EXCAVATOR MACHINE HAVING SELF-CONTAINED ELECTROHYDRAULIC POWER UNITS

Karl H. Ullmann, Dortmund, Fed. Rep. of Germany, assignor to Harnischfeger Corporation, West Milwaukee, Wis.

Filed May 17, 1978, Ser. No. 906,983

Int. Cl.[2] **E02F** *9/22*

U.S. Cl. 414—694 **12 Claims**



1. A modular electrohydraulic high fluid pressure power unit for connection between a pair of relatively movable large components and operable to effect relative movement therebetween comprising:

a housing having a chamber therein defining a fluid reservoir and a pair of spaced apart openings on opposite sides of said chamber;

a pair of hydraulic rams mounted in said openings on said housing in parallel spaced apart relationship, each ram comprising a cylinder, a piston in said cylinder, and a piston rod connected to said piston and extending from said cylinder;

means mounted on said housing and on each piston rod for connecting said power unit to said pair of relatively movable components;

a reversible hydraulic pump mounted within said chamber of said housing for supplying fluid to operate said hydraulic rams;

an electric motor mounted on said housing between said pair of rams and connected to drive said pump;

and remotely controllable means on said pump for controlling said pump.

4,193,734

BOOM FOR BACKHOE WITH INTERNALLY DISPOSED HYDRAULIC FEED LINES

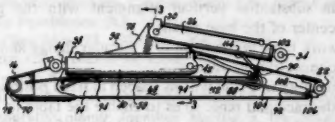
Derrick G. Williams, Sale, England, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Jun. 30, 1978, Ser. No. 921,030

Claims priority, application United Kingdom, Jul. 12, 1977, 29205/77

Int. Cl.[2] **E02F** *3/85*

U.S. Cl. 414—694 **5 Claims**



1. A lifting machine boom having two side walls maintained in spaced relationship to each other by a bottom wall and a top wall, first pivot means at one end of the boom and second pivot means on the side walls for the purpose of attaching one end of a hydraulic actuator used for elevating the boom about said first pivot means, a first and second longitudinally extending chambers with said second pivot means within said second

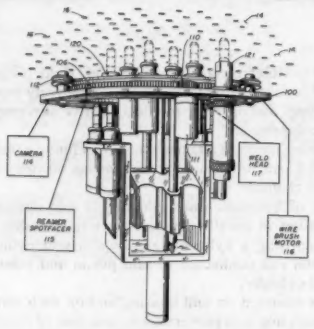
chamber, and at least a first rigid pipe attached to said median well and arranged to run longitudinally of the boom within said first chamber from a first end located adjacent said one end of the boom to a second end located nearer the other end of the boom, said second end being provided for connection with said hydraulic actuator.

4,193,735

WORK TABLE FOR A STEPPED PLATFORM

Dennis E. Savor, Hixson, and James W. Hales, Harrison, both of Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 24, 1978, Ser. No. 899,447
Int. Cl.[2] F28G *15/04*
U.S. Cl. 414—744 **3 Claims**



1. In a surface traversing apparatus adapted to be supported near a member for traversing the surface of the member by stepwise motion, the surface traversing apparatus including base means, first and second anchor means each movably connected to the base means for stepwise lateral relative motion in different respective directions, the first and second anchor means being selectively engageable with the member for resisting lateral motion relative thereto, first and second actuating means operatively connected to the first and second anchor means respectively and to the base means for moving the respective first and second anchor means laterally relative to one another in discrete steps, means to alternately engage the first and second anchor means with the member while the other of the anchor means is disengaged from the member so as to transport the first and second anchor means laterally relative to the other of the anchor means by the first or second actuating means respectively to move the first and second anchor means to new relative positions, the improvement wherein,

a circular race is mounted on the base means with its center in substantial vertical alignment with the geometrical center of the base means,

a work table in the form of a circular flange and positioned concentric the race,

a plurality of guide wheels spaced at fixed positions between the race and table so as to enable the table to rotate relative the race in a plane parallel the surface of the member,

motor means connected between the race and table to rotate the table to selected positions relative to the surface traversed by the base,

and tools mounted at stations on the work table,

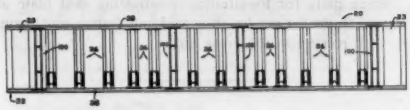
whereby each tool is positioned in a desired sequence over the same location on the surface of the member to carry out work on the same surface structure.

4,193,736

RAILWAY CAR LOOSE SHEET MATERIAL SHIPPING SUPPORT LOADING ARRANGEMENT

Ronald J. Thomaswick, Kittanning, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 634,688, Nov. 24, 1975, Pat. No. 4,127,071.
This application Aug. 30, 1978, Ser. No. 938,209
Int. Cl.[2] B60P *7/10*; B61D *3/08*; B65J *67/02, 69/00*
U.S. Cl. 414—786 **2 Claims**



1. A method of loading at least one article having a predetermined length and weight on a railcar having a pair of spaced longitudinal runners mounted on the bed of the railcar comprising:

positioning between the longitudinal runners a plurality of lateral deck runners spaced a distance less than the length of the at least one article for supporting the at least one article;

securing the lateral deck runners in position;

positioning a stanchion on selected ones of the lateral deck runners such that the combined weight of the at least one article supported by the stanchion and the stanchion have a center of gravity approximately at the longitudinal center of the railcar;

securing the stanchion in position to its respective lateral deck runner;

loading the at least one article on the lateral deck runners and respective stanchion; and

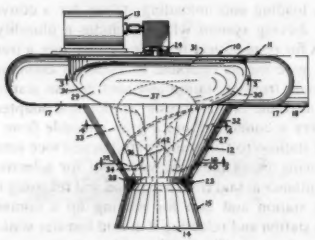
securing the at least one article in position to prevent longitudinal, vertical and lateral movement of the at least one article relative to the lateral deck runners.

4,193,737

FISH PUMP

George H. Lemmon, Rte. 1, Box 218, Hagerman, Id. 83332

Filed Sep. 22, 1977, Ser. No. 835,677
Int. Cl.[2] F04D *1/02*
U.S. Cl. 415—73 **1 Claim**



1. A fish pump for pumping live fish having a known maximum length, comprising:

a hollow casing having a forward end with an intake opening centered on a pump longitudinal axis and a rear end with an enlarged unobstructed angular volute channel formed therein communicating with a tangential discharge opening;

a mixed flow rotor mounted within the casing for rotation about the longitudinal axis in a desired angular direction, said rotor having an intake end adjacent the intake opening of the casing and a discharge end projecting into the rear end of the casing;

said rotor having at least two fish passageways formed

therein that are symmetrical with respect to the longitudinal axis and are merged at the rotor intake end coaxially along the longitudinal axis to form an unobstructed recessed, axially-extending, inlet opening communicating with the casing intake opening to initially receive the fish therein in a substantially axial orientation as the rotor is rotated;

wherein the rotor inlet opening has axially extending leading edges that extend from a periphery of the rotor inlet opening rearward and radially inward to an apex along the longitudinal axis in which the apex is axially spaced along the longitudinal axis from the annular volute channel;

wherein the axially extending leading edges have smooth curved surfaces facing the direction of rotation of the rotor to guide the fish from the recessed rotor inlet opening into the fish passageways;

said fish passageways extending axially rearward and diverging radially outward through the rotor to tangentially directed, peripheral exit openings that progressively merge into the annular volute opening;

wherein the minimum cross-sectional dimensions of the rotor inlet opening, the rotor passageways and the rotor exit openings in conjunction with the annular volute channel are at least equal to one-half the known maximum fish length; and

wherein each of the fish passageways extends axially and radially in a helical-spiral path about the longitudinal axis in which the path has a progressively decreasing helical pitch that varies along a cycloid curve to initially receive the live fish in the axial recessed inlet opening in a substantially axial orientation and then axially and radially conveying the live fish from the inlet opening through the rotor passageway in a helical-spiral path about the longitudinal axis with the live fish progressively passing tangentially into the volute channel for tangential discharge from the pump through the tangential discharge opening.

4,193,738

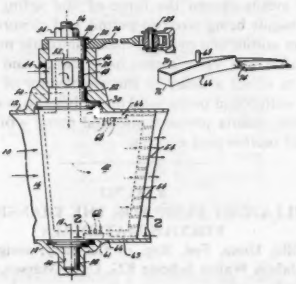
FLOATING SEAL FOR A VARIABLE AREA TURBINE NOZZLE

Delmer H. Landis, Jr.; Theodore T. Thomas, Jr., both of Loveland, and Charles J. Haap, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Sep. 19, 1977, Ser. No. 834,626

Int. Cl.[2] F01D *9/02;* **F16J** *15/16*

U.S. Cl. 415—115 **5 Claims**



5. A turbomachinery vane having a tip, a pressure surface, a suction surface, a leading edge and a trailing edge for use in cooperation with a proximate flow path defining wall and having cooling air circulating through the interior thereof comprising:

a seal for disposition within a cavity formed within the tip proximate the wall wherein the cavity extends to the vane trailing edge and forms an opening through the vane pressure surface;

means communicating between the hollow vane interior and the cavity for directing a flow of air into the cavity, thereby urging the seal outwardly into contact with the wall; and

a seal surface comprising a portion of the seal extending laterally beyond the vane through the cavity opening in the vane pressure surface, and means for exposing said seal surface to the pressure of the turbine operating fluid to create a force thereon to further urge the seal outwardly into contact with the wall.

4,193,739

DEVICE FOR TURNING THE ROTOR OF A GAS TURBINE ENGINE

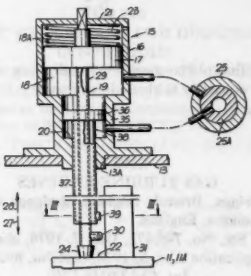
Desmond C. Lucey, Avon, England, assignor to Rolls-Royce Limited, London, England

Filed May 22, 1978, Ser. No. 908,454

Claims priority, application United Kingdom, Jun. 2, 1977, 23407/77

Int. Cl.[2] F01D *25/34*

U.S. Cl. 415—118 **3 Claims**



1. Device for turning a rotor of a gas turbine engine comprising an engine casing a member insertable through an aperture in said casing of said engine into a position adjacent blades provided on the rotor, said member including means for directing a pressurised gas on to said blades so as to cause rotation of said rotor, and means for urging said member into friction engagement with the rotor for stopping thereof.

4,193,740

VIBRATION ISOLATOR FOR FLEXIBLE BLADED FAN

Herbert N. Charles, Chatham, Canada, assignor to Fram Corporation, East Providence, R.I.

Filed Mar. 15, 1978, Ser. No. 886,676

Int. Cl.[2] F16D *3/64, 3/14;* **F04D** *29/20*

U.S. Cl. 416—132 A **8 Claims**

1. A fan and a vibration isolator in combination, comprising:

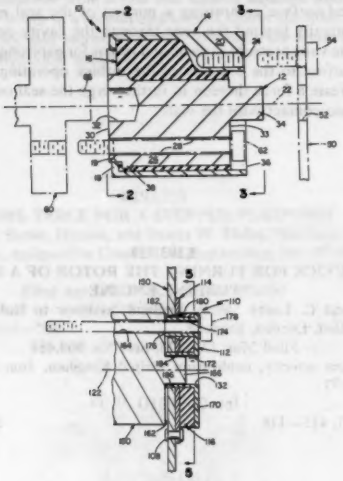
a first generally planar member having a fan attached thereto;

a second generally planar member adapted for connection to a fan driver;

a resilient member intermediate and arranged to transmit torque between said first and second planar members; and

alignment means, comprising a plurality of tubes projecting from one side of said second planar member through

aligned openings in said first planar member such that there is no torque-transmitting contact between said tubes



and said first planar member, for aligning said isolator and said fan coaxially with said fan driver.

4,193,741

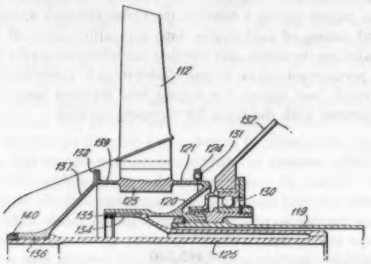
GAS TURBINE ENGINES

Henry R. Briggs, Bristol, England, assignor to Rolls-Royce Limited, London, England

Division of Ser. No. 748,371, Dec. 7, 1976, abandoned. This application Apr. 5, 1978, Ser. No. 893,817

Int. Cl.[2] F01D *5/10*

U.S. Cl. 416—170 R **3 Claims**



1. A gas turbine engine comprising

a hollow main shaft,

a first mounting structure for supporting a rotor from the exterior of the shaft and including

a frangible driving connection which is dimensioned to fracture when transverse loads on the rotor exceed a predetermined magnitude, and

a second mounting structure which includes a tubular auxiliary drive shift connected at one end to rotate with said main shaft and extending through the hollow interior of said main shaft and through an end of said main shaft to the rotor to form a transversely flexible connection between said main shaft and said rotor.

4,193,742

VACUUM PUMP ASSEMBLY WITH BUILT-IN SHUTOFF VALVE

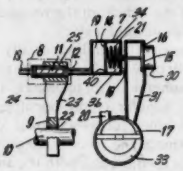
Klaus Fischer, Wetzlar; Helmut Flauger, Braunfels; Kurt Balzer, and Roland Fischer, both of Wetzlar, all of Fed. Rep. of Germany, assignors to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH, Asslar, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 625,717, Oct. 24, 1975, abandoned. This application Mar. 6, 1978, Ser. No. 883,792

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1974, 2451685

Int. Cl.[2] F04B *49/06*

U.S. Cl. 417—295 **6 Claims**



1. A vacuum pump assembly comprising: a vacuum pump including a suction port adapted to be placed in flow communication with a space to be evacuated; valve means for opening and closing said suction port; spring means biasing said valve means toward a position to open said suction port; and control means for applying to said valve means a closure pressure acting against said spring means to cause said valve means to close said suction port when said vacuum pump is stopped and for removing said closure pressure therefrom when said vacuum pump is started in order to permit opening of said suction port; said control means including auxiliary valve means operating to open and close in response to starting and stopping of said vacuum pump to control application of said closure pressure to said valve means, cylinder means, piston means operatively engaged within said cylinder means, connecting means joining said piston means with said valve means for effecting correlative movement therebetween, means enclosing a pump working volume within which said valve means and suction port are located, and passage means placing said pump working volume in flow communication with said cylinder means; said auxiliary valve means being connected to effect application of said closure pressure to said piston means within said cylinder means against the force of said spring means; said passage means being sized to permit said closure pressure to flow from within said cylinder means into said pump working volume after said valve means have closed said suction port thereby to effect a delay in the application of said closure pressure within said pump working volume to avoid introduction of said closure pressure into said pump working volume while said suction port is open.

4,193,743

OSCILLATORY PUMP FOR THE TRANSPORT OF VISCOUS MATERIALS

Heinz Bille, Unna, Fed. Rep. of Germany, assignor to Maschinenfabrik Walter Scheele KG, Unna-Massen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 777,811, Mar. 15, 1977, abandoned. This application Mar. 19, 1979, Ser. No. 21,853

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1976, 2611124

Int. Cl.[2] F04C *21/00;* **F04B** *15/02*

U.S. Cl. 417—481 **8 Claims**

1. A piston pump for the transport of viscous materials and, in particular, concrete, comprising:

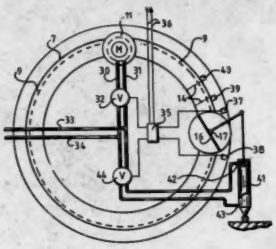
a housing including a ring-shaped body having a U-shaped cross-section which has defined therein an annular-shaped

working space, and a ring-shaped cover which closes said working space;

a piston, slidably mounted within said annular-shaped working space, for oscillating movement;

a pressure conduit and a suction conduit, each of which is communicative with said working space;

control means for connecting the portion of said working space which lies in front of the moving piston, to said pressure conduit and for simultaneously connecting the portion of said working space which lies in back of the moving piston, to said suction conduit, said control means



including a member which is disposed in said annular-shaped working space; and

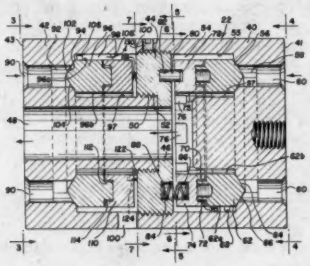
means for reversibly driving said piston so that said piston moves in an oscillating manner in said annular working space, reversing its direction when said piston nears said member of said control means disposed in said annular-shaped working space, said means for driving including a drive ring, slidably supported on the underside of said cover, to which said piston is secured, said piston projecting downwardly therefrom into said working space of said body.

4,193,744

COMPRESSOR VALVE

William M. Spence, Kerens, Tex., assignor to Nipak, Inc., Dallas, Tex.

Filed Mar. 27, 1978, Ser. No. 890,243
Int. Cl.[2] F04B *39/10*
U.S. Cl. 417—567 **8 Claims**



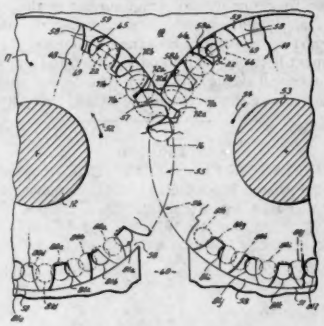
1. In a compressor having a reciprocating piston slideably disposed in a compression chamber formed by a cylinder, said compression chamber having an inlet passage and an outlet passage, a valve disposed between said inlet and outlet passages comprising: a suction end body having an inlet communicating with the inlet in said compression chamber, said inlet communicating with an annular passage formed in said body which communicates with the compression chamber; a suction valve seat formed in said body formed between the inlet passage and annular passage; an annular suction valve disc disposed in said annular passage having an outer side spaced from the outer wall of said annular passage and an inner wall of said valve disc being spaced from the inner wall of said annular passage; means to urge said sucton valve disc into sealing relation with said suction valve seat; a suction dampening plate secured between said means to urge said suction valve disc in sealing relationship with said suction valve seat and said suction valve disc; a discharge valve body having an inlet communicating with said compression chamber said inlet communicating with an annular discharge passage formed in said discharge end body, said annular discharge passage communicating with the outlet of said compression chamber; a discharge valve seat formed between said inlet and annular passage in said discharge end body; a discharge valve disc having an outer side spaced from the outer wall of said annular discharge passage and an inner side spaced from the inner wall of said annular discharge passage; means to urge said discharge valve disc into sealing relation with said discharge valve seat, said discharge valve disc being adapted to move off of said discharge valve seat when gases are being compressed through said inlet in said discharge end body and said suction valve disc being adapted to be urged off of said suction valve seat when gases are being pulled through said compression chamber inlet to said compression chamber; and a discharge dampening plate secured between said discharge valve disc and said means to urge said discharge valve disc into sealing relationship with said discharge valve seat.

4,193,745

GEAR PUMP WITH MEANS FOR DISPERSING GAS INTO LIQUID

William M. Hamilton, Lorain; Charles H. Scholl, Vermilion; Jeffrey J. Kruke, Lorain, and Larry D. Akers, Vermilion, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Mar. 9, 1978, Ser. No. 884,826
Int. Cl.[2] F04C *1/08, 13/00, 11/00;* B01F *5/14*
U.S. Cl. 418—9 **17 Claims**



1. In a gear pump wherein a gas under pressure and a liquid are introduced into a pumping chamber, intermixed by the action of the gear teeth which mesh in intertooth spaces in said pumping chamber and the mixture is delivered to an outlet port,

mixing means for improving the dispersion of the gas in the liquid comprising,

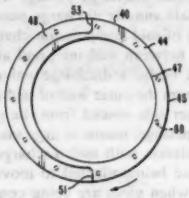
a series of blind cavities formed in a surface which adjoins said chamber, said cavities opening to said chamber, said cavities being at spaced positions along the path of movement of the teeth of at least one of said gears, said teeth wiping across the respective cavities as the gear rotates, the intertooth spaces of said gear alternately connecting to and disconnecting from the cavities in sequence as the gear rotates, the cavities when connected to the respective intertooth spaces providing additional volume into which gas in the intertooth spaces can surge, thereby improving the dispersion of the gas in the liquid.

4,193,746

REVERSIBLE GEROTOR PUMP

Robert C. Aman, Jr., Minneapolis, Minn., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 16, 1978, Ser. No. 878,552
Int. Cl.[2] F04C 1/06, 15/02
U.S. Cl. 418—32 3 Claims



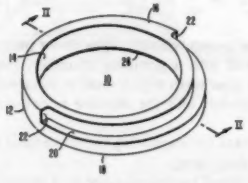
1. A reversible pump having a housing defining a generally cylindrical cavity, an internally-toothed rotor having a circular periphery and an eccentric meshing engagement with an externally-toothed gear, drive means extending into said housing for driving said gear and rotor, a collar member having a substantially cylindrical outer peripheral surface sized to be in close proximity to the cylindrical surface of the housing and having a planar lower surface adjacent the planar surface of a stationary member in the said cavity and defining a cylindrical opening on an axis eccentric from the outer peripheral surface, said opening sized to receive said rotor in a generally close fit and with said collar member rotatable within said housing through frictional engagement with said rotor, means for limiting the rotation of said collar member to a 180° arc for positioning the rotor axis within said opening relative to the gear axis to maintain delivery of a pumped fluid to a discharge opening in said pump and a plurality of discrete projections struck up from the normal planar surface of the member for limiting the surface area of contact between the member and the support surface and in turn thereby limiting the frictional engagement between said collar member and the planar stationary adjacent facing surface so as to be less than the frictional engagement between said collar and said rotor.

4,193,747

REVERSING PUMP ECCENTRIC MEMBER

Loyal V. Pittman, Bloomington, Minn., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 16, 1978, Ser. No. 887,282
Int. Cl.[2] F04C 1/06, 15/02; F16C 33/06
U.S. Cl. 418—32 3 Claims



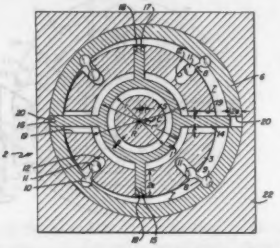
1. A reversing eccentric member for a pump or the like, said member defining a ring having an outer circular wall and an inner circular wall which are not concentric, a generally planar upper surface and a generally planar bottom surface, said bottom surface having an annular marginal area adjacent the inner circular wall projecting outwardly from the normal plane of the surface, said area having indentations forming channels extending completely across said area to enhance lubrication film shearing when said ring is rotated relative to a facing plate resulting in a raised bearing surface of reduced area and wherein said raised surface is substantially flat and in a plane perpendicular to said walls.

4,193,748

YOKE COUPLER FOR TWO ECCENTRICALLY ROTATING MEMBERS

James C. Swain, 3891 Mountview Rd., Columbus, Ohio 43220

Filed Jul. 13, 1978, Ser. No. 924,136
Int. Cl.[2] F01C 1/00, 21/00; F03C 3/00; F16D 3/04
U.S. Cl. 418—173 1 Claim



1. A fluid displacement device comprising:
a rotor having a drive shaft;
a cylindrical cam ring surrounding the rotor and eccentrically mounted with respect thereto;
a housing member rotatably carrying the cam ring;
a pair of side plates sealingly attached to the housing and having journal means therein for rotatably carrying the drive shaft;
a plurality of pumping vanes pivotally attached to the cam ring and having a sliding and pivotal interconnection to the rotor, forming a plurality of pumping chambers therebetween;
a coupling member interconnecting the rotor and the cam ring comprising:
a central hub circumscribing the drive shaft and carrying four outwardly projecting four-sided coplaner arms, and disposed in fluid sealing engagement between the out-facing side of said arms and hub and the in-facing side of one of said plates;
a pair of opposed slots disposed in the lateral side of the cam ring, each being respectively adapted to slidingly receive and in fluid sealing engagement with one of two opposed arms carried by said central hub.
a pair of opposed slots disposed in the lateral side of the rotor, each being respectively adapted to slidingly receive, and in fluid sealing engagement with, one of two opposed arms carried by said central hub.

4,193,749

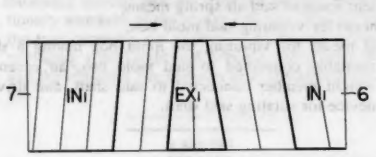
SCREW BLOWER

Shuichi Yamazaki, Kamifukuoka, and Keisuki Ban, Fujimi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1978, Ser. No. 870,255
Claims priority, application Japan, Jan. 27, 1977, 52/7994
Int. Cl.[2] F04C 1/10
U.S. Cl. 418—201 6 Claims

1. A screw blower comprising: a pair of rotary driving shafts disposed in parallel relation; means for rotatably driving the shafts in opposite directions; a pair of rotors having the same axial length secured to said shafts for rotation therewith, said rotors having respective teeth for meshing with one another; each of said teeth having a helix angle and meshing in male and female relationship with one another; an intake chamber for gases opening at the side of the teeth whereby the teeth disengage as the rotors rotate; an exhaust chamber for the gases

opening at the side of the teeth, at which said teeth engage as the rotors rotate, the opening portion of said exhaust chamber extends over the entire length of said rotors; and a casing having a cylindrical inner peripheral surface surrounding said rotors in air-tight slidably engaging relation, said casing being



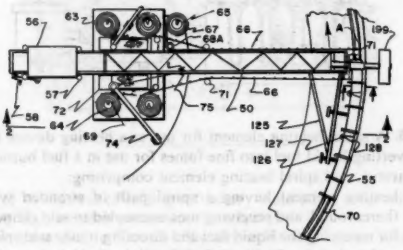
discontinuous at said opening of said intake chamber and said opening of said exhaust chamber, such that grooves formed between said meshing teeth come into communication with said opening of said exhaust chamber at the same time when said grooves start to compress gases trapped in said grooves.

4,193,750

SELF-PROPELLED SLIP FORM MACHINE

Jay P. Nielson, 3490 Monte Verde Dr., Salt Lake City, Utah 84109

Filed Nov. 28, 1977, Ser. No. 855,167
Int. Cl.² B28B *21/12*
U.S. Cl. 425—60 **24 Claims**



1. A self-propelled, slip form machine for casting and forming a concrete mix or the like in a continuous band, comprising a boom mounted for travel along a predetermined path; a slip form carried by an end of the boom and closed at its front, top, and sides by respective walls but open at its bottom and rear, thereby providing during use a pressure chamber for receiving the concrete mix; means for introducing a concrete mix or the like into the slip form; and means for exerting pressure against the front wall of said slip form from inside the pressure chamber through the intermediacy of the concrete mix deposited in said chamber, so as to advance said slip form and boom while forming the concrete mix.

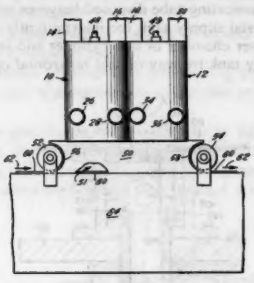
4,193,751

MULTIPLE DISTRIBUTOR HEADS FOR LAYING DRY FIBERS

Fredric N. Miller, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Jun. 15, 1978, Ser. No. 915,865
Int. Cl.² B29J *5/00*
U.S. Cl. 425—83.1 **3 Claims**

1. Apparatus for disposing a uniform web of dry fibers on a forming-wire screen, comprising: a plurality of fiber distributors including housings disposed in side-by-side relationship with no gap therebetween and having bottom openings disposed in side-by-side relationship; foraminous screens extending over said openings; a forming tunnel disposed beneath said openings; a movable forming-wire screen disposed within said tunnel for travel therethrough sequentially beneath one then another of said openings; means for introducing dry fibers to said housings for discharge through said openings, and the screens extending thereover, onto said forming-wire screen as



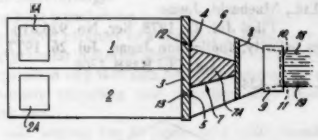
it is moved therepast; and sealing means on opposite ends of said tunnel accommodating movement of said forming-wire screen therethrough.

4,193,752

MANUFACTURE OF MARBLED DETERGENT BARS

Leslie Hunt, Wirral; Ian T. Nicolson, Birkenhead, and Thomas M. Whitfield, Wirral, all of England, assignors to Lever Brothers Co., New York, N.Y.

Division of Ser. No. 779,774, Mar. 21, 1977, Pat. No. 4,162,288.
This application Aug. 22, 1978, Ser. No. 935,825
Claims priority, application United Kingdom, Mar. 26, 1976, 12242/76
Int. Cl.² B29F *3/12*
U.S. Cl. 425—131.1 **6 Claims**



1. Detergent processing apparatus suitable for the injection of liquid into a detergent mass comprising two extruders, a common extrusion cone into which the extruders open, apertured pressure plate areas between the extruders and the extrusion cone, an unapertured area between said apertured areas, liquid injection means positioned within or immediately downstream of the apertured plate areas, a partition extending downstream from the unapertured area, and side surfaces on the partition forming together with the inner surfaces of the extrusion cone separate compression volumes for each detergent stream.

4,193,753

APPARATUS FOR AUTOMATICALLY PRODUCING FLOWER-SHAPED DECORATIONS

Sunao Yoshioka, 576,, Oaza-Umebayashi, Nishi-ku, Fukuoka, Japan

Filed Dec. 28, 1978, Ser. No. 973,985
Int. Cl.² B29F *3/04, 3/06*
U.S. Cl. 425—311 **2 Claims**

1. Apparatus for automatically producing flower-shaped decorations comprising:

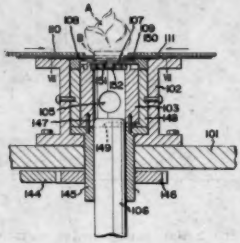
(a) a flower-forming casing fixedly mounted on a frame structure, said casing having both ends thereof open-ended,

(b) a cylinder rotatably encased in said casing, said cylinder

having a horizontal opening formed to a peripheral wall thereof,

(c) a raw material supply tank mounted on said frame structure,

(d) a communicating tube disposed between said casing and raw material supply tank for intermittently communicating an inner chamber of said cylinder and said raw material supply tank by way of said horizontal opening,



(e) a pattern plate mounted on said casing, said plate having a plurality of concentric flower-forming apertures,

(f) a piston rod elevatably disposed in said cylinder, for extruding a flower-shaped decoration through said apertures,

(g) a pair of stem-forming plates disposed on said pattern plate, said plates having semicircular notches at corresponding inner ends, and

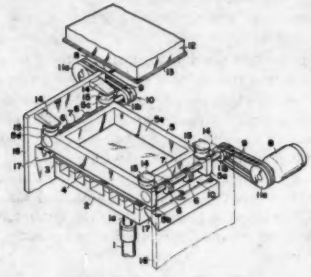
(h) a pair of cutting-off plates disposed on said pattern plate.

4,193,754

VIBRATING APPARATUS FOR FORMING CONCRETE BLOCKS

Yoji Sekiguchi, Maebashi, Japan, assignor to Katsura Machine Co., Ltd., Maebashi, Japan

Filed Jul. 21, 1978, Ser. No. 926,816
Claims priority, application Japan, Jul. 26, 1977, 52-89443
Int. Cl.[2] B28B *1/08*
U.S. Cl. 425—424 **6 Claims**



1. Vibrating apparatus for forming a concrete block comprising:

(a) a framework which has arms at opposite sides thereof and receiving blocks at a portion lower than said arms with a predetermined distance between said arms and said receiving blocks;

(b) a four-sided mold box for forming a concrete block;

(c) a receiving plate at the bottom of said mold box;

(d) a platform which has a resilient layer thereon, said mold box being vertically movable and held in position by said receiving plate and said platform;

(e) air spring means for resiliently pressing said mold box downwardly;
said air spring means having a plurality of bellows, each of which is disposed at the bottom of said arms of the framework, (f) a hydraulic cylinder means for pressing said platform and said receiving plate upwardly above said receiving blocks such that said receiving plate is closely contacted with said mold box against the resilient force of said air spring means;

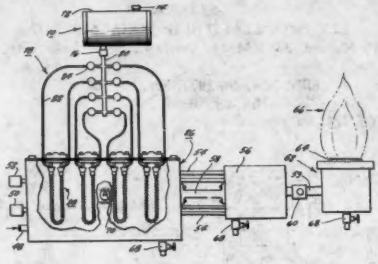
(g) means for vibrating said mold box,
said means for vibrating the mold box having a shaft rotatably connected to said mold box, an eccentric weight member connected to said shaft, and driving device for rotating said shaft.

4,193,755

LIQUID TO GAS FUEL CONVERSION BURNER DEVICE

Vincent Guarnaschelli, Greenlawn, and Mitchell Reiss, Dix Hills, both of N.Y., assignors to R & G Energy Research Corporation, New York, N.Y.

Filed May 5, 1978, Ser. No. 903,089
Int. Cl.[2] F23D *11/44*
U.S. Cl. 431—207 **17 Claims**



15. A spiral heating element for use as a heating device for converting liquid fuel into fine fumes for use in a fuel burning apparatus, said spiral heating element comprising:

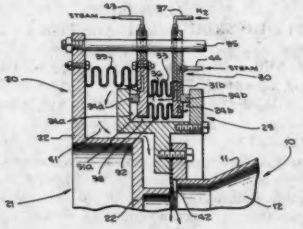
a heating element having a spiral path of stranded wire therearound, and receiving means coupled to said element for receiving the liquid fuel and directing it into said spiral path, whereby the liquid fuel flows through the stranded wire around said heating element until it is converted almost entirely into fine fumes.

4,193,756

SEAL ASSEMBLY AND METHOD FOR PROVIDING A SEAL IN A ROTARY KILN

F. Roland Leon, Los Angeles, Calif., assignor to Tosco Corporation, Los Angeles, Calif.

Filed Mar. 8, 1978, Ser. No. 884,597
Int. Cl.[2] F27B *7/24*
U.S. Cl. 432—3 **16 Claims**



1. A seal assembly adapted for use with a rotary kiln, and adapted to provide a fluid-tight seal between the stationary

members and the rotating members of the rotary kiln, comprising:

a rotating, outwardly-facing, substantially U-shaped annular rim integral with the rotating members of the rotary kiln and having two opposing rim surfaces; and

a stationary annular bellows chamber integral with the stationary members of the rotary kiln and disposed between the two opposing rim surfaces, and including means for providing a fluid-tight seal between the bellows chamber and the opposing rim surfaces so as to define a seal chamber.

4,193,757

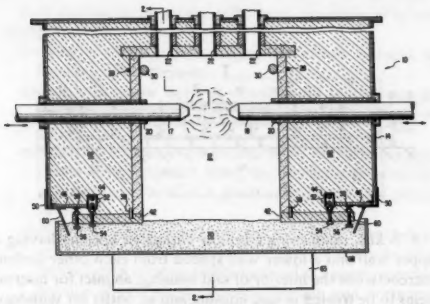
FURNACE CONSTRUCTION AND METHODS OF LOADING AND SEALING A COMBUSTION CHAMBER THEREIN

Samuel R. Elkins, Jr., Chamblee, Ga., assignor to Electro Minerals, Inc., Lawrenceville, Ga.

Filed Jul. 24, 1978, Ser. No. 927,292

Int. Cl.[2] F27D *1/16, 1/00;* **H05B** *7/18*

U.S. Cl. 432—3 **19 Claims**



13. A method of sealing refractory material to form refractory ingots which comprises the steps of

a. providing a furnace chamber within a furnace having enclosed side wall members and a top wall member,

b. arranging a group of graphite floor members with a central aperture therein,

c. positioning a refractory material within a container beneath said central aperture in said graphite floor members,

d. providing a downwardly extending skirt member constituting a sealing member from the superstructure of said furnace,

e. and elevating said refractory containing container sufficiently far to embed said skirt member within said refractory material thereby sealing the bottom of said furnace chamber.

4,193,758

GRANULAR BED HEATING METHOD

Don G. Peterson, Frisco, and Judson M. Harper, Fort Collins, both of Colo., assignors to Food Processes, Inc., Saginaw, Mich.

Division of Ser. No. 695,826, Jun. 14, 1976, Pat. No. 4,094,633. This application Oct. 31, 1977, Ser. No. 846,974

Int. Cl.[2] F27B *15/00*

U.S. Cl. 432—27 **5 Claims**

1. A method for heating a granulated product, said method comprising the steps of:

inputting a granulated heat transferring material into a rotatable heating bin;

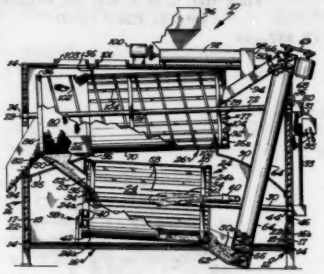
directly heating said granulated heat transferring material by directing heat into the interior of the rotatable heating bin;

raising said granular heat transferring material upward within said heating bin and dropping said heat transferring material through the highest heating zone within said heating bin in response to rotation of said heating bin as said heat transferring material moves longitudinally along said heating bin so as to increase heat transfer to said heat transferring material;

outputting heated granular material from said heating bin in response to rotation thereof;

inputting heated granular heat transferring material outputted from said heating bin into a rotatable product cooking bin;

inputting a granulated raw product to be heated into said rotatable cooking bin simultaneously with the step of inputting said granular heat transferring material thereto, thereby commingling said raw product with said heated granular heat transferring material to facilitate heating of said raw product by exposure to said heated granular heat transferring material;



rotating said product cooking bin thereby transporting commingled heated granular heat transferring material and product therethrough;

separating heat transferring material from product and outputting heated product to a separate external station;

returning granular material separated from said product in said separation step into said rotatable heating bin thereby continuously recycling said granular heat transferring material; and

rotating said heating bin to again heat said granular heat transferring material to facilitate repetition of said process.

4,193,759

ROTARY KILN WITH A PLURALITY OF PLANETARY COOLING TUBES

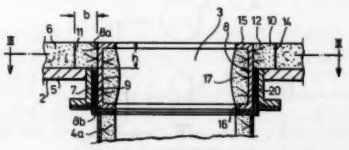
Jürgen Wurr, Ennigerloh; Antonius Vering, Ahlen, and Bodo Ermer, Sendenhorst, all of Fed. Rep. of Germany, assignors to Polysius AG, Neubeckum, Fed. Rep. of Germany

Filed Jan. 3, 1978, Ser. No. 866,559

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1977, 2702876

Int. Cl.[2] F27B *7/38*

U.S. Cl. 432—78 **15 Claims**



1. In a rotary kiln having a refractory lining, a plurality of discharge port openings, a corresponding plurality of planetary cooling tubes, and a corresponding plurality of intake sleeves connected one to each of said tubes and having a portion thereof extending into one of said openings, the improve-

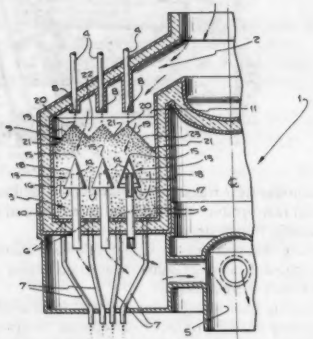
ment comprising annular collars of refractory material separate from said lining and corresponding in number to the number of said sleeves, each of said collars encircling and being snugly fitted to the extending portion of one of said sleeves and being accommodated in an annular recess formed in said lining, each of said collars being flush with the surface of said lining; and hold-down members affixing each of said collars to said extending portion of its associated sleeve.

4,193,760

APPARATUS AND METHOD FOR HEATING A PLURALITY OF SOLIDS

R. Glenn Vawter, Northridge, and Charles S. Waitman, Hacienda Heights, both of Calif., assignors to Tosco Corporation, Los Angeles, Calif.

Filed Mar. 6, 1978, Ser. No. 883,386
Int. Cl.[2] F28D *15/00*
U.S. Cl. 432—96 **9 Claims**



1. In a device for raising the temperature of a plurality of solids to a higher temperature having heating chamber means with at least one hot flue gas inlet for connection to a source of hot flue gas, at least one hot flue gas outlet, at least one solid inlet aperture for connection to a source of solids which are relatively cooler than said hot flue gas, said solids being fed into said heating chamber means and at least one solids aperture, the improvement comprising the provision of:

individual disengager means associated with said one hot flue gas outlet only such that solids are deflected by said disengager means only relative said one hot flue gas outlet and are prevented from entering said one hot flue gas outlet, and

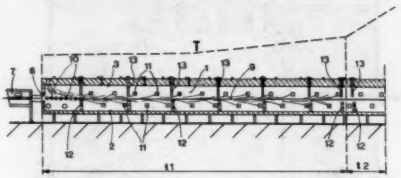
means for coaxially mounting said one hot flue gas outlet downstream of and displaced from said one solids inlet aperture and means for positioning said disengager means intermediate the hot flue gas outlet and solids inlet aperture, whereby said disengager means is positioned within a direct flow path of said solids from said solids inlet aperture and thermal stressing of the individual disengager means possible wherein it is associated with a plurality of hot flue gas outlets is prevented.

4,193,761

KILN

Enzo Mantegani, Via Clusone 2, Milano, Italy

Filed Sep. 29, 1978, Ser. No. 947,177
Claims priority, application Italy, Oct. 7, 1977, 28362 A/77; Jul. 10, 1978, 25490 A/78
Int. Cl.[2] F27B *9/20*
U.S. Cl. 432—128 **11 Claims**



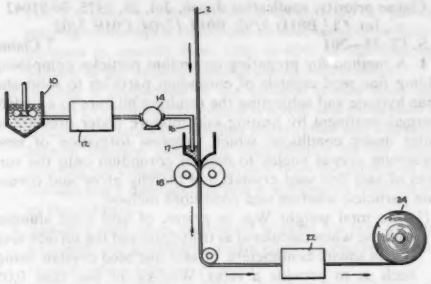
1. A kiln, comprising a hollow elongated housing having an upper wall and a lower wall spaced from each other defining therebetween the interior of said housing, an inlet for inserting items to be treated in said housing and an outlet for withdrawing the treated items from the housing; a first set of baffles spaced from one another along the length of said housing and mounted on said lower wall of said housing and extending towards said upper wall thereof; a second set of baffles spaced from one another along the length of said housing and mounted on said upper wall of said housing and extending towards said lower wall thereof, said first and second sets of baffles bounding between them a gap extending along the length of said housing, said gap defining a transport path for items to be treated, at least one set of baffles being adjustable so as to vary the width of the gap; and means for transporting the items to be treated through said gap from said inlet to said outlet of said housing.

4,193,762

TEXTILE TREATMENT PROCESS

Chettoor G. Namboodri, North Augusta, S.C., assignor to United Merchants and Manufacturers, Inc., New York, N.Y.

Filed May 1, 1978, Ser. No. 901,780
Int. Cl.[2] D06B *1/00*; D06P *5/00*
U.S. Cl. 8—14 9 Claims



1. A process for applying a finishing treatment to a textile material which comprises

forming a stable foam composition which includes said finishing agent therein;

routing said textile material downwardly in a substantially vertical path through a pair of horizontally disposed pressure rollers;

maintaining a predetermined amount of said foam composition in a dam disposed along the vertical path of travel of said textile material at a point upstream of said pressure rollers;

routing said textile material in the proximity of said dam to apply said foam composition to at least one side of said downwardly moving textile material at a point prior to the passage of said textile material through said horizontally disposed pressure rollers;

and forcing the foam on the surface of the vertically disposed textile material into the material and collapsing the foam by means of said pressure rollers to effect penetration of said foam into said fabric.

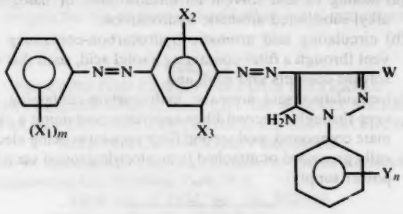
4,193,763

DYEING AND PRINTING OF WATER-SWELLABLE CELLULOSE MATERIAL AND BLENDS THEREOF WITH SYNTHETIC FIBRES, BY MEANS OF DISAZO DYES DERIVED FROM AMINO-PYRAZOLE

Roberto Cipolli, and Gioacchino Boffa, both of Novara, Italy, assignors to Aziende Colori Nazionali Affini Acna S.p.A., Milan, Italy

Filed Feb. 7, 1978, Ser. No. 875,937
Claims priority, application Italy, Feb. 7, 1977, 20004 A/77
Int. Cl.[2] D06P *3/82*
U.S. Cl. 8—21 C 4 Claims

1. Process for the dyeing and printing of fabrics comprised of water-swellable cellulose material and blends thereof with synthetic materials, said process comprising dyeing and printing the material in the presence of water and of a high-boiling solvent selected from the group consisting of polyols and ethers and esters thereof, said solvent being capable of maintaining cellulose in the swollen state at the application temperature, with disazo dyes having the general formula:



wherein:

X_1=hydrogen, alkyl having 1 to 4 carbon atoms or alkoxyl having 1 to 4 carbon atoms, chlorine, bromine, —CN, —$NHCOR_1$, —NHCO—Ar, —COOR, —$CON(R_1)_2$, and —NO_2;

X_2=hydrogen, alkyl having 1 to 4 carbon atoms or alkoxyl having 1 to 4 carbon atoms, chlorine, bromine, —$NHCOR_1$, —NHCO—Ar;

X_3=alkyl having 1 to 4 carbon atoms or alkoxyl having 1 to 4 carbon atoms, or —$NHCOR_1$ or —NHCO—Ar;

Y=H, alkyl having 1 to 4 carbon atoms or alkoxyl having 1 to 4 carbon atoms, chlorine, bromine;

W=hydrogen or alkyl C_{1-4};

R=an alkyl C_1–C_4;

R_1=hydrogen or alkyl C_1–C_4;

Ar=a substituted or unsubstituted phenyl; and

m and n are integers from 1 to 3.

4,193,764

FAT-LIQUORING COMPOSITIONS FOR LEATHER

Yoshikazu Murai; Okitsugu Tsuji, and Atsushi Sato, all of Yokohama, Japan, assignors to Nippon Petrochemicals Co., Ltd., Tokyo, Japan

Filed May 4, 1978, Ser. No. 902,958
Claims priority, application Japan, May 10, 1977, 52-52652
Int. Cl.[2] C14C *5/00*, *11/00*
U.S. Cl. 8—94.22 12 Claims

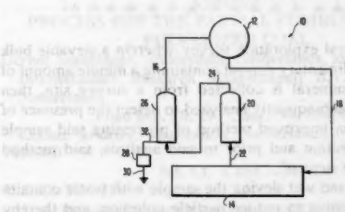
1. A fat-liquoring composition for leather comprising 100 parts by weight of a non-prehydrolyzed neutralized polybutene sulfonation product, 1–100 parts by weight of a polybutene and 1–100 parts by weight of at least one fatty acid salt.

4,193,765

DRYCLEANING ASSEMBLY AND METHOD FOR REMOVING IMPURITIES AND RESIDUAL MOISTURE FROM AN ORGANIC DRYCLEANING SOLVENT

Herman R. Jackson, 1981 San Marco Blvd., Jacksonville, Fla. 32207

Filed Dec. 21, 1977, Ser. No. 862,882
The portion of the term of this patent subsequent to Mar. 7, 1995, has been disclaimed.
Int. Cl.[2] D06L *1/10*
U.S. Cl. 8—142 13 Claims



1. A method for removing impurities and residual moisture from an organic drycleaning solvent comprising in sequence:

(a) adding to said solvent an unsubstituted or halogen-or alkyl-substituted aromatic hydrocarbon;
(b) circulating said aromatic hydrocarbon-containing solvent through a filter containing a solid acid, such that said solvent contacts said acid; and
(c) circulating said aromatic hydrocarbon-containing solvent through a second filter apparatus containing a chromate compound, said second filter apparatus being electrically grounded or attached to an electric ground via a DC power supply.

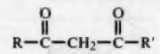
4,193,766

DEVICE AND METHOD FOR PREPARATION OF A CONTROL SOLUTION FOR KETONE DETERMINATION

Louis G. Daunora; Charles T. W. Lam, and Myron C. Rapkin, all of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 13, 1978, Ser. No. 959,693
Int. Cl.[2] G01N *33/16, 21/48*
U.S. Cl. 23—230 R **25 Claims**

1. A device useful in the preparation of a ketone control solution, said device comprising a carrier vehicle incorporated with a predetermined quantity of a metal ion complex of a dione compound, said metal ion being aluminum (III), cobalt, copper (II), iron (III), magnesium, nickel or zinc, and said dione compound having the structure



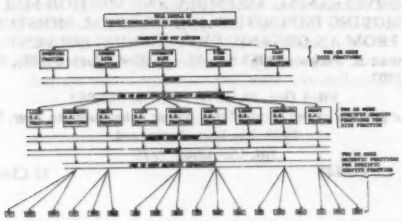
in which R and R′, same or different, are alkyl groups having 1 to about 6 carbon atoms.

4,193,767

PARTICULATE MINERAL SEPARATION PROCESS

Charles E. Fipke, 263 Lake Ave., Kelowna, British Columbia, Canada

Continuation-in-part of Ser. No. 804,541, Jun. 8, 1977, abandoned. This application Oct. 26, 1978, Ser. No. 954,754
Int. Cl.[2] G01N *33/24*
U.S. Cl. 23—230 EP **40 Claims**



1. In a mineral exploration survey wherein a sievable bulk sample of a sedimentary deposit containing a minute amount of an economic mineral is collected from a survey site, then processed and subsequently analyzed to detect the presence of said mineral, an improved method of processing said sample after said collection and prior to said analysis, said method comprising the steps of:
(a) washing and wet sieving the sample with water containing an additive to reduce particle cohesion, and thereby obtaining at least two size fractions of said sample;
(b) drying at least one of said size fractions; and
(c) separating with heavy liquid said last mentioned size fraction into at least two specific gravity fractions.

4,193,768

METHOD FOR PREPARING CORUNDUM PARTICLES

Naoaki Ohishi, Machida; Toshiaki Sakaida, and Mitsuru Hasegawa, both of Yokohama, all of Japan, assignors to Showa Denko K. K., Tokyo, Japan

Continuation of Ser. No. 703,228, Jul. 7, 1976, abandoned. This application Dec. 19, 1977, Ser. No. 862,138
Claims priority, application Japan, Jul. 28, 1975, 50-91042
Int. Cl.[2] B01D *9/02*; B01J *17/04*; C01F *7/02*
U.S. Cl. 23—301 **7 Claims**

1. A method for preparing corundum particles comprising adding fine seed crystals of corundum particles to solid alumina hydrate and subjecting the resulting mixture to a hydrothermal treatment by heating said mixture under pressure in water under conditions which suppress formation of new corundum crystal nuclei, to deposit corundum onto the surfaces of said fine seed crystals and thereby grow said corundum particles; wherein said conditions include:
(1) the total weight W_R, in grams, of said solid alumina hydrate when calculated as trihydrate and the surface area A_S, in square centimeters, of said fine seed crystals being such as to provide a ratio, W_R/A_S, of less than 0.05 g/cm^2, to ensure the deposition of said corundum on the surfaces of said fine seed crystals before the concentration of aluminate ions derived from said solid alumina hydrate in said water during said hydrothermal treatment, reaches a value sufficient to produce new corundum crystal nuclei;
(2) said solid alumina hydrate and said fine seed crystals being uniformly mixed prior to said hydrothermal treatment; and
(3) suppressing the convection current of said water to a minimum by packing said uniform mixture, in water, in a first container and placing said first container in a second larger container for said hydrothermal treatment;
and wherein the temperature and pressure of said hydrothermal treatment are 370° to 450° C. and 150 to 500 kg/cm^2, respectively.

4,193,769

ZNO DISPERSIONS BY DECOMPOSITION OF $ZNCO_3$

William J. Cheng, and David B. Guthrie, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Oct. 23, 1978, Ser. No. 953,983
Int. Cl.[2] C01G *9/02*
U.S. Cl. 44—51 **6 Claims**

1. A process of preparing a stable, bright, clear, fluid zinc-containing dispersion which comprises decomposing $ZnCO_3$ to ZnO at a temperature between about 175° C. to about 450° C. in a dispersant-containing fluid, said fluid being a non-volatile process fluid capable of being heated to the decomposition temperature of $ZnCO_3$, said dispersant being relatively stable under the high temperature conditions of this process and being capable of retaining the zinc compound formed by decomposition in stable suspension.

4,193,770

PREPARATION OF GASOLINE CONTAINING TERTIARYAMYL METHYL ETHER

John D. Chase, Oakville; Hanbury J. Woods, Campbellville, and Bruce W. Kennedy, Toronto, all of Canada, assignors to Gulf Canada Limited, Toronto, Canada

Continuation-in-part of Ser. No. 863,499, Dec. 22, 1977, abandoned. This application May 15, 1978, Ser. No. 905,903
Int. Cl.[2] C10L *1/18*
U.S. Cl. 44—56 **16 Claims**

1. Process for preparation of gasoline containing tertiaryamyl methyl ether which comprises
1. separating, from lower and higher boiling compounds, an olefinic hydrocarbon portion boiling at atmospheric pressure in the range from 80° F. to 122° F. (27° C. to 50° C.) and containing a mixture of hydrocarbons having predom-

inantly five carbon atoms each, of which hydrocarbons at least 10% are 2-methyl butenes,

2. passing the olefinic hydrocarbon portion, together with methanol in a proportion of from 0.5 to 3.0 mols of methanol per mol 2-methyl butenes present, into contact with a bed of solid acidic etherifying catalyst in a reactor at temperature in the range from 150° F. to 240° F. (66° C. to 116° C.) under pressure sufficient to maintain the passing material in the liquid phase, said contact being of sufficient duration to etherify from 15% to 60% of the 2-methyl butenes in the passing material during said contact,
3. passing a proportion of the effluent stream from said reactor to a distillation column wherein said proportion of effluent is fractionally distilled under reflux and wherein a bottom fraction containing substantially all the ethers entering the column is withdrawn from the bottom of the column and a distillate fraction is withdrawn from the top of the column,
4. blending said ether containing bottom fraction and any remainder of the effluent stream passing directly from said reactor into a gasoline product,
5. recycling a proportion of the distillate fraction from the top of the column to the reactor for additional contact with said catalyst, and
6. passing a proportion of said distillate fraction into said gasoline product when the entire effluent stream from the reactor is passed to the distillation column.

4,193,771

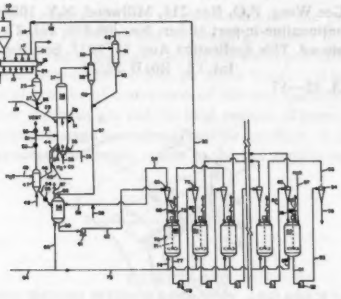
ALKALI METAL RECOVERY FROM CARBONACEOUS MATERIAL CONVERSION PROCESS

David W. Sharp, Seabrook; LeRoy R. Clavenna, Baytown, both of Tex.; Martin L. Gorbaty, Fanwood, N.J., and Joe M. Tsou, Galveston, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 8, 1978, Ser. No. 903,635

Int. Cl.[2] C10J *3/06*

U.S. Cl. 48—197 R **15 Claims**



1. In a process for the conversion of a solid carbonaceous feed material in the presence of an alkali metal-containing catalyst into liquids and/or gases wherein said conversion takes place in a reaction zone to produce particles containing alkali metal residues, said particles are transferred to an alkali metal recovery zone where they are treated for the recovery of alkali metal constituents, and the recovered alkali metal constituents are used in said conversion process as at least a portion of the alkali metal constituents comprising said alkali metal-containing catalyst, the improvement which comprises:

(a) withdrawing and passing said particles from said reaction zone to said alkali metal recovery zone in the substantial absence of molecular oxygen during the entire period of said withdrawal and passage; and

(b) treating said particles throughout the entirety of said recovery zone in the substantial absence of molecular oxygen for the recovery of said alkali metal constituents.

4,193,772

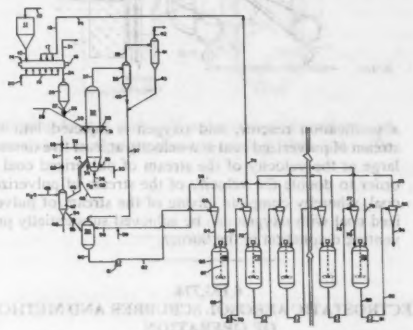
PROCESS FOR CARBONACEOUS MATERIAL CONVERSION AND RECOVERY OF ALKALI METAL CATALYST CONSTITUENTS HELD BY ION EXCHANGE SITES IN CONVERSION RESIDUE

David W. Sharp, Seabrook, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 5, 1978, Ser. No. 912,610

Int. Cl.[2] C10J *3/06*

U.S. Cl. 48—197 R **11 Claims**



1. In a process for the conversion of a solid carbonaceous feed material in the presence of an alkali metal-containing catalyst into liquids and/or gases wherein particles containing alkali metal residues are produced, the improvement which comprises:

(a) contacting said particles containing said alkali metal residues with a sufficiently concentrated aqueous solution of a calcium or magnesium-containing compound at a temperature below about 249° F. whereby calcium or magnesium ions from said calcium or magnesium-containing compound displace alkali metal ions held by ion exchange sites in said particles thereby producing an aqueous effluent containing alkali metal constituents and wherein said temperature is sufficiently below about 249° F. to substantially prevent the conversion of water-insoluble alkali metal aluminosilicates and other water-insoluble alkali metal compounds in said particles into water-soluble alkali metal compounds; and

(b) using said alkali metal constituents from said aqueous effluent produced in step (a) in said conversion process as at least a portion of the alkali metal constituents comprising said alkali metal-containing catalyst.

4,193,773

PROCESS FOR THE PARTIAL COMBUSTION OF PULVERIZED COAL

Gernot Staudinger, Amsterdam, Netherlands, assignor to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed Sep. 20, 1977, Ser. No. 834,890

Claims priority, application Netherlands, Sep. 23, 1976, 7610560

Int. Cl.[2] C10J *3/50*

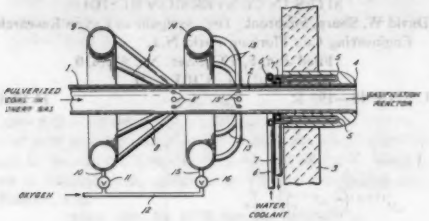
U.S. Cl. 48—210 **9 Claims**

1. A process for supplying pulverized coal for the partial combustion of pulverized coal in a gasification reactor, comprising the steps of:

mixing pulverized coal with a substantially inert carrier gas to form a fluidized stream;

flowing said fluidized stream of pulverized coal in the carrier gas into and through a burner for discharge into a gasification reactor; and

injecting at least some oxygen as separate jets directly into said fluidized stream of pulverized coal and carrier gas through separate holes in the burner before substantial burning of said pulverized coal and prior to discharge into



a gasification reactor, said oxygen is injected into the stream of pulverized coal at a velocity at least five times as large as the velocity of the stream of pulverized coal in order to double the velocity of the stream of pulverized coal, whereby complete mixing of the stream of pulverized coal with oxygen can be achieved substantially preventing detonation in the burner.

4,193,774

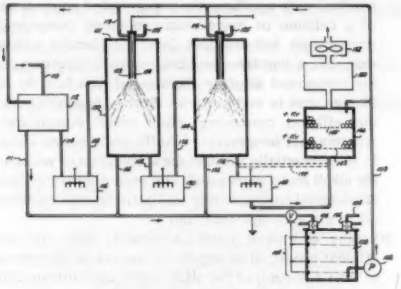
ELECTROSTATIC AEROSOL SCRUBBER AND METHOD OF OPERATION

Michael J. Pilat, 7306 57th Ave. NE., Seattle, Wash. 98115

Continuation of Ser. No. 752,988, Dec. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 492,157, Jul. 26, 1974, abandoned. This application Sep. 17, 1978, Ser. No. 926,126

Int. Cl.[2] B03C *3/16*

U.S. Cl. 55—10 **22 Claims**



1. A method of removing aerosol particles from a flowing gaseous stream comprising the steps of:

imposing a first electrostatic charge upon the particles contained in said flowing gaseous stream;

contacting the flowing gaseous stream with a spray of liquid, the droplets forming said spray having a second electrostatic charge thereon differing in potential from said first electrostatic charge, whereby a portion of said aerosol particles is collected upon said liquid droplets;

removing at least a portion of said liquid droplets upon which said aerosol particles have been collected from said gaseous stream;

passing said gaseous stream containing a reduced quantity of aerosol particles therein, and entrained liquid droplets, into a bubble-forming gas-liquid contact apparatus, wherein said gaseous stream forms bubbles and is intimately intermixed with scrubbing liquid supported upon said bubble-forming apparatus, said scrubbing liquid having a third electrostatic charge thereon opposite in polarity to said first electrostatic charge, whereby said particles and said liquid droplets are captured and removed from said gaseous stream; and

exhausting the scrubbed gaseous stream from said bubble-forming apparatus.

4. An electrostatic wet scrubber and collector assembly comprising:

means defining a spray chamber having an inlet and an outlet;

means positioned and arranged with respect to said spray chamber to impose a first electrostatic charge upon particulate matter contained in a gaseous stream entering said spray chamber;

liquid spray means in said spray chamber to inject droplets of a liquid into said chamber and means to impose on said droplets a second electrostatic charge of a differing potential from said first electrostatic charge, whereby said gaseous stream contains charged liquid droplets and charged particulate matter which are attracted toward each other;

a bubble scrubber means in fluid communication with said spray chamber having means to receive said gaseous stream from the outlet of said spray chamber and to cause said gaseous stream to flow upwardly, said bubble scrubber means comprising at least one bubble-forming means for supporting a bubble-forming liquid thereon positioned within a vertical tower;

means positioned and arranged with respect to said bubble scrubber means to impose a third electrostatic charge on said bubble-forming liquid; said third electrostatic charge being of a polarity opposite to at least one of said first and said second electrostatic charges;

means positioned and arranged with respect to said bubble-forming means to recycle said bubble-forming liquid including a sump and pump means.

4,193,775

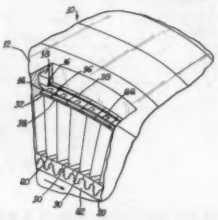
METHODS AND APPARATUS FOR SEPARATING GASES WITH VENTILATED BLADES

Chia-Gee Wang, P.O. Box 211, Millwood, N.Y. 10546

Continuation-in-part of Ser. No. 708,939, Jul. 27, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,515

Int. Cl.[2] B01D *59/20*

U.S. Cl. 55—17 **1 Claim**



1. A turbomechanical method for separating a gas mixture of different molecular weight components, on the basis of molecular weight of the components of the mixture, comprising the steps of

introducing the gas mixture into a separation zone, rotatably forcing a plurality of curved-surface blades into the gas mixture in the separation zone to accelerate the gas laterally of the direction of motion of the blades under non-turbulent flow conditions, said acceleration being along the axis of rotation of the blades, and to produce a density gradient in the laterally accelerated gas adjacent the curved surfaces of the blades forced into the gas mixture, and

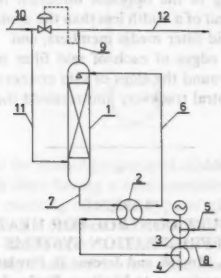
separating a higher molecular weight fraction of said laterally accelerated gas immediately adjacent the curved surfaces of said blades to provide higher and lower molecular weight gas fractions by diverting said higher molecular weight gas fraction immediately adjacent the surfaces of said blades to the respective interiors of said blades through smooth, porous zones of said curved blade surfaces.

4,193,776

METHOD FOR THE PURIFICATION OF THE PROCESS CONDENSATE FROM SYNTHESIS GASES AND HYDROGEN PLANT

Tadeusz Wasala; Marek Dmoch, and Henryk Jozwiak, all of Pulawy, Poland, assignors to Instytut Nawozow Sztucznych, Pulawy, Poland

Filed Feb. 28, 1979, Ser. No. 16,313
Claims priority, application Poland, Mar. 3, 1978, 205094
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—49 **3 Claims**



1. In the invented method of purification of the process condensate from hydrogen and synthesis gas plants utilizing steam stripping, the stripping is carried out under pressure with a part or total amount of the process steam before it is used in the chemical process of conversion of the raw materials into hydrogen or synthesis gas and the total amount of steam leaving the stripping stage containing volatile products of degassing the process condensate is sent to the gas generating process.

4,193,777

PAINTING ROOM WITH RECOVERY ARRANGEMENT

Francois-Xavier J. de la Riviere, Paris, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

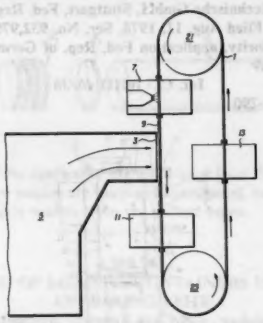
Filed Jul. 5, 1978, Ser. No. 922,057
Claims priority, application France, Jul. 5, 1977, 77 20697
Int. Cl.[2] B01D *46/04*
U.S. Cl. 55—96 **8 Claims**

1. A process for recovering particles of paint suspended in a gas, which comprises:

coating the surfaces of baffles with a material which is solid at the operating temperature of the painting environment and to which paint particles adhere, and having a melting point below 100° C.;

positioning said coated baffles in a sequence spaced apart from one another;

collecting paint particles suspended in a gas on said coated baffles by flowing said gas around said baffles to thereby saturate said coating with paint particles;



utilizing heat to melt said paint saturated coating; and

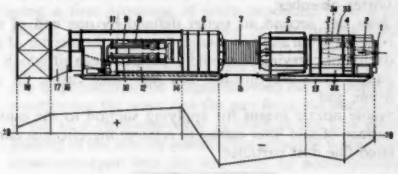
removing said paint saturated coating from said baffles.

4,193,778

DEVICE FOR REMOVING DUST-SHAPED PARTICLES FROM AN AIR STREAM SERVING FOR THE VENTILATION OF MINES

Emanuel Strahsner, and Alfred Zitz, both of Zeltweg, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke—Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Nov. 8, 1977, Ser. No. 849,617
Claims priority, application Austria, Nov. 12, 1976, 8432/76
Int. Cl.[2] B01D *45/12, 47/10, 50/00*
U.S. Cl. 55—238 **8 Claims**

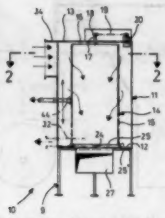


1. A gas scrubber having an air inlet and an air exit, said scrubber comprising: a plurality of venturi tubes having upstream ends in communicating with the air inlet and having downstream ends, the venturi tubes being arranged parallel to each other; a centrifugal separator in communication with the downstream ends of the venturi tubes; blower means for drawing dust-laden air into the upstream ends of the venturi tubes and then into the centrifugal separator; nozzle means for introducing water into the air flowing through the venturi tubes; an inner tubular housing surrounding the venturi tubes; an outer tubular housing surrounding and spaced from the inner tubular housing so as to form a space between the housings; conduit means for conducting air from the blower means to said air exit; a funnel widening in the air flow direction so as to have an inlet end and an outlet end of larger cross section than the inlet end, the inlet end being connected to said air exit; and porous air filter material connected completely across the outlet end of the funnel.

4,193,779
AIR FILTERING APPARATUS

Dietmar Hencke, Moglingen, Fed. Rep. of Germany, assignor to LTG Lufttechnische GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 11, 1978, Ser. No. 932,975
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1978, 2802369
Int. Cl.[2] B01D *46/38*
U.S. Cl. 55—290 16 Claims



1. An air filter apparatus comprising:
a housing defining a vortex chamber;
a rotatable drum disposed in said vortex chamber and provided with a filter casing on its circumference for preventing the passage of fine dust therethrough but permitting the passage of clean air from the outside to the interior of said drum;
air transport means for generating a pressure drop across said apparatus to thereby cause transport of air through said filtering apparatus;
at least one air inlet for admitting contaminated air to said vortex chamber, said at least one air inlet terminating in said vortex chamber tangentially thereof for generating a rotary vortex flow of air in said vortex chamber;
at least one first air outlet from said vortex chamber for removing therefrom air carrying fibers and other contaminants which are large compared with fine dust, said at least one first air outlet leading out of said vortex chamber essentially tangentially therewith, said at least one air inlet being disposed in the vicinity of one of the axial ends of said vortex chamber while said at least one first air outlet is disposed in the vicinity of the opposite axial end of said vortex chamber;
at least one second air outlet defined by one end of said rotating drum and communicating with the interior of said drum, for carrying from said apparatus clean air which has passed inwardly through said fine filter casing on said drum; and
movable nozzle means for applying suction to the outside surface of said filter casing to remove therefrom accumulated fine dust particles.

4,193,780
AIR FILTER CONSTRUCTION

Worth Cotton, Jr., and A. Reese Hunter, both of Greensboro, N.C., assignors to Industrial Air, Inc., Greensboro, N.C.

Filed Mar. 20, 1978, Ser. No. 890,573
Int. Cl.[2] B01D *46/06, 46/40*
U.S. Cl. 55—378 6 Claims

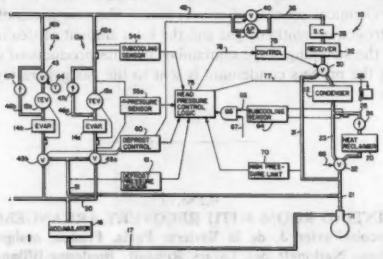
1. An improved V-cell filter construction for emplacement within a walled conduit through which a contaminated air stream passes and comprising:
(a) a plurality of separate, V-shaped wire mesh members arranged in side-by-side relationship presenting a plurality of V-shaped cells extending across said walled conduit in the path of said air stream, each of said wire mesh members having lateral edges thereof positioned on the upstream side of said filter construction;
(b) a connecting means for engaging and holding in position the corresponding lateral edges of adjacent wire mesh members, said connecting means including a pair of spaced, outer trackways into which said lateral edges extend and means for retaining said lateral edges therein;
(c) a plurality of separate, fibrous, filter media members folded into a generally V-shape and of a size, shape, and number generally corresponding to the size, shape and number of said V-cells, one of said filter media members inserted into each of said cells;

(d) said connecting means further including a central trackway opening in the opposite direction from said outer trackways and of a width less than the combined thickness of two of said filter media members; and
(e) the lateral edges of each of said filter media members extending around the sides of said connecting means and into said central trackway and retained therein.

4,193,781
HEAD PRESSURE CONTROL FOR HEAT RECLAIM REFRIGERATION SYSTEMS

Kenneth E. Vogel, Mound, and Jerome D. Powlas, Minneapolis, both of Minn., assignors to McQuay-Perfex Inc., Minneapolis, Minn.

Filed Apr. 28, 1978, Ser. No. 900,992
Int. Cl.[2] F25B *41/00*
U.S. Cl. 62—81 13 Claims



1. A control system for a refrigeration system capable of different modes of operation, comprising:
(a) a plurality of sensing means operative for sensing conditions of the refrigeration system operation which are indicative of operation thereof in each of said modes;
(b) head control means operatively connected for controlling condensing temperature and pressure of the refrigeration system; and
(c) control means connected to said sensing means and to said head control means and operative to maintain refrigeration system pressure substantially at the optimum pressure requirement for the active mode having the highest pressure requirement.

4,193,782

DEVICE FOR DRAWING A GROUP OF CLADDED LIGHT CONDUCTING FIBERS

Hubert Aulich, Munich; Josef Grabmaier, Berg, and Karl-Heinz Eisenrith, Schliersee, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 13, 1978, Ser. No. 924,176
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1977, 2734152
Int. Cl.[2] C03B 37/02
U.S. Cl. 65—11 R 9 Claims

1. In a device for drawing a group of cladded light conducting fibers, each fiber having a core consisting of a first glass material and a cladding of second type of glass material, said device comprising a double crucible having an inner crucible with a bottom and an outer crucible with a bottom, the inner crucible receiving a melt of the first glass material for the core and the outer crucible receiving a melt of the second glass material for the cladding, the bottom of the inner crucible as well as the bottom of the outer crucible being provided with a multitude of nozzles with the central axis of each nozzle in the inner crucible being aligned with the central axis of a corresponding nozzle of the outer crucible, and said device including means for gathering the plurality of cladded fibers and coating the gathered fibers to form a bundle of coated, cladded fibers with the improvement comprising said inner crucible having an annular ring-shaped bottom with annular inner and outer walls, said inner crucible being disposed in the outer crucible with the ring-shaped bottom being parallel to the bottom of the outer crucible, and the nozzles being arranged on the bottoms of said crucibles on a circle concentric with the walls of the inner crucible so that the same temperature prevails for the glass melt present in the double crucibles being drawn through each nozzle.

4,193,783

METHOD OF TREATING A SILICON SINGLE CRYSTAL INGOT

Yoshiaki Matsushita, Toyko, Japan, assignor to VLSI Technology Research Association, Kawasaki, Japan

Filed Jun. 15, 1978, Ser. No. 915,870
Claims priority, application Japan, Jun. 15, 1977, 52/70625
Int. Cl.[2] C03C 15/00
U.S. Cl. 65—31 35 Claims

1. A method of preparing silicon wafers from a silicon, single crystal ingot comprising the steps of:

purposely producing lattice strains in the surface of the silicon, single crystal ingot,

heating the ingot at least 15 hours at a temperature between 1,000° C. and 1,200° C.,

cooling the ingot

etching off the surface of the ingot to at least the depth that the lattice strains are purposely produced, and

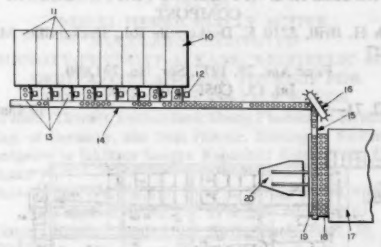
cutting silicon wafers from the etched ingot.

4,193,784

METHOD OF LOADING CONTAINERS INTO AN ANNEALING LEHR

Eustace H. Mumford, Ottawa Lake, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 19, 1978, Ser. No. 952,749
Int. Cl.[2] C03B 9/14, 27/00
U.S. Cl. 65—69 4 Claims



1. In the method of handling newly formed ware, produced by an inline, plural section glassware forming machine, from the forming machine to the machine conveyor and then to the lehr, the improvement in placing the ware on the machine conveyor comprising the steps of:

placing a first grouping of ware produced from a plural section bottle forming machine on the moving machine conveyor at equally spaced intervals in a single line, placing successive groupings of ware on said conveyor with a gap of predetermined length between each grouping, and transferring the ware and the gap from the machine conveyor to a cross-conveyor in front of the lehr whereby loading of the lehr by pushing the group of ware from the cross-conveyor into the lehr may be accomplished on groupings of ware which are separated by a cut-off gap.

4,193,785

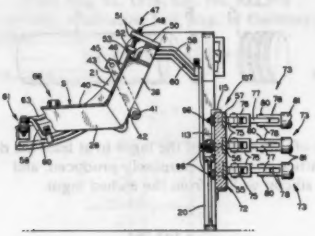
GLASS SHEET BENDING MOLD APPARATUS

Harold A. Bailey, Genoa, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Aug. 15, 1978, Ser. No. 933,712
Int. Cl.[2] C03B 23/02
U.S. Cl. 65—285 8 Claims

1. Apparatus for bending a glass sheet to a relatively sharp angle by passing electric current through an electrically conducting path formed on the sheet to generate heat along said path and bend the sheet therealong comprising: a frame having opposite end members, an outline type bending mold supported on said frame and having a substantially continuous shaping surface formed thereon and conforming to the margin of the glass sheet to be bent, electrically conducting means including a plurality of bus bars mounted on one of said frame end members in spaced relation thereto for engagement by

electrically conducting probes, and a unitary, one-piece electrical insulating member substantially coextensive with said one end member and interposed between said one end member and



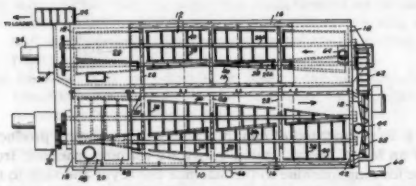
said bus bars for electrically insulating the latter from said frame, said insulating member engageable with said bus bars along substantially the entire lengths thereof to provide support against inward deflection of said bus bars.

4,193,786

PROCESS AND APPARATUS FOR PRODUCING COMPOST

Joseph H. Brill, 5210 E. Deckerville Rd., Deckerville, Mich. 48427

Filed Apr. 28, 1977, Ser. No. 791,690
Int. Cl.[2] **C05F** *11/08, 3/00*
U.S. Cl. 71—9 **10 Claims**



1. The method of producing a fermented product in a horizontally elongated chamber having a pair of rotatable shafts therein journalled on generally horizontally extending parallel axes which are spaced apart in a horizontal plane, each shaft having at least one row of radially projecting fingers thereon spaced along the axis of each shaft, said fingers being located and dimensioned relative to said chamber and the spacing of said shafts so that substantially the entire contents of the chamber are agitated by the churning and lifting action of the fingers when the shafts are rotated, which comprises:

(a) loading into said chamber a batch comprising a mixture consisting of about 40 to 60% animal waste and the remainder essentially a carbonaceous filler material, said mixture having a moisture content substantially higher than 50% by weight, said batch being of a predetermined volume such as to only partially fill said chamber and thereby provide a substantial air space throughout the length of the chamber above the level of the batch mixture therein;

(b) after loading, isolating said chamber from the surrounding atmosphere except for the hereinafter mentioned air flow;

(c) rotating the two shafts in opposite directions so that the fingers thereon travel through the mixture in a direction which tends to displace it from the opposite longitudinal sides of the chamber laterally inwardly and upwardly toward the longitudinal central portion of the chamber;

(d) rotating the shafts at a rate such that the mixture is progressively agitated by the circumferentially successive rows of fingers on each shaft about once every three minutes but not more than about once every one-half minute to thereby cause substantially all portions of the mixture to progressively come into intimate and relatively prolonged contact with the hereinafter mentioned air;

(e) while said shafts are rotating, conducting fresh air over the mixture through the entire length of said chamber at a rate of between about ¼ to 2¼ cubic feet per minute per hundred cubic feet of the batch mixture in the chamber, thereby causing fermentation of the mixture to proceed at such rate as to raise the temperature of the mixture to about 210° F. within a period of not more than about 18 hours without the application of external heat;

(f) continuing the flow of air and rotation of said shafts at said rates while and after the temperature thereof levels off at said elevated value to cool the moist fermented product so formed to a relatively low temperature approaching room temperature;

(g) drying the cooled moist product so formed to reduce its moisture content to a maximum of not more than about 50% by weight before substantial anaerobic decomposition of the fermented product occurs; and

(h) maintaining substantially the entire batch of said product in said dried condition until it is ready for use.

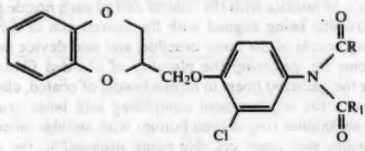
4,193,787

BENZODIOXANE HERBICIDES

Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

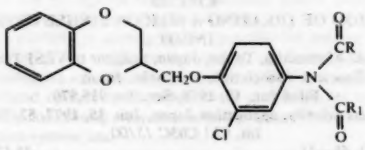
Filed Aug. 31, 1978, Ser. No. 938,605
Int. Cl.[2] **A01N** *9/00*; **C07D** *319/20*
U.S. Cl. 71—88 **18 Claims**

1. A compound having the formula



wherein R and R_1 are independently selected from the group consisting of alkoxy having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms and alkyl having from 1 to 6 carbon atoms.

13. A method of controlling undesirable vegetation comprising applying to the locus thereof a post-emergent herbicidally effective amount of the formula



wherein R and R_1 are independently selected from the group consisting of alkoxy having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms and alkyl having from 1 to 6 carbon atoms.

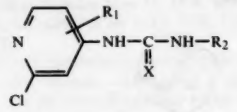
4,193,788

N-(2-CHLORO-4-PYRIDYL)UREAS

Koichi Shudo, 2000-10-2-116 Kosugayacho, Totsukaku, Yokohama; Toshihiko Okamoto, 1-7-21 Shinoharakita, Kohokuku, Yokohama; Yo Isogai, 1-1-2-609, Kamiyoga, Setagayaku, Tokyo, and Soshiro Takahashi, 904-10, Oaza, Kamiokubo, Urawashi, Saitama, all of Japan

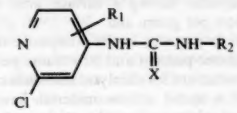
Filed Oct. 2, 1978, Ser. No. 947,468
Claims priority, application Japan, Oct. 8, 1977, 52-121285
Int. Cl.[2] A01N *9/22*; C07D *401/12, 213/46, 213/52*
U.S. Cl. 71—94 20 Claims

1. A compound selected from the group consisting of N-(2-chloro-4-pyridyl)ureas of the following formula.



wherein R_1 represents hydrogen or alkyl of from 1 to 3 carbon atoms, inclusive; R_2 represents aryl selected from the group consisting of phenyl, pyridyl, naphthyl, and biphenyl, which may be substituted by alkyl of from 1 to 3 carbon atoms, inclusive; alkoxy; of from 1 to 3 carbon atoms, inclusive; hydroxyl or halogen; and X stands for oxygen or sulfur; and acid addition salts thereof.

5. An agricultural composition useful as a plant growth regulator comprising as active ingredient a compound selected from the group consisting of an N-(2-chloro-4-pyridyl)urea of claim 1, of the formula:



wherein R_1 represents hydrogen or alkyl of from 1 to 3 carbon atoms, inclusive; R_2 represents aryl selected from the group consisting of phenyl, pyridyl, naphthyl, and biphenyl, which may be substituted by alkyl of from 1 to 3 carbon atoms, inclusive; alkoxy of from 1 to 3 carbon atoms, inclusive; hydroxyl or halogen; and X is oxygen or sulfur; and an acid addition salt thereof, in an effective plant-growth regulating amount, together with an inert carrier or diluent.

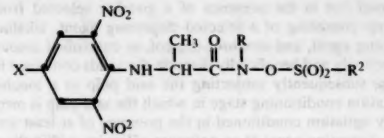
4,193,789

HERBICIDAL DERIVATIVES OF N-ALKYLPROPANAMIDES

Ian D. Entwistle, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 910,404, Jun. 19, 1978, which is a continuation-in-part of Ser. No. 855,104, Nov. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 826,214, Aug. 19, 1977, abandoned. This application Feb. 5, 1979, Ser. No. 9,336
Int. Cl.[2] A01N *9/14*
U.S. Cl. 71—103 7 Claims

1. The racemic or the (d) form of a compound of the formula



wherein X is an alkyl group containing from 1 to 4 carbon atoms optionally substituted by halogen, an alkylsulfonyl group or a halogen atom; R is an alkyl group containing from 1 to 4 carbon atoms; and R^2 is an alkyl group containing from 1 to 6 carbon atoms optionally substituted by a halogen atom having an atomic number of from 9 to 35, inclusive, or a phenyl, benzyl, phenethyl or naphthyl group optionally ring-substituted by from 1 to 5 nitro groups, by alkyl or alkoxy groups containing from 1 to 4 carbon atoms and/or by halogen atoms having an atomic number of from 9 to 35, inclusive.

5. A method for controlling undesirable plant growth at a locus which comprises applying to the locus to be protected a herbicidally effective amount of a compound according to claim 1 or a composition thereof.

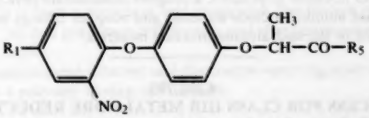
4,193,790

NOVEL HERBICIDALLY ACTIVE, NUCLEAR-SUBSTITUTED PHENOXY-PHENOXY-ALKANECARBOXYLIC ACID DERIVATIVES AND USE THEREOF FOR CONTROLLING GRASS-LIKE WEEDS

Otto Rohr, Therwil, Switzerland; Georg Pissiotas, Lörrach, Fed. Rep. of Germany, and Beat Böhner, Binningen, Switzerland, assignors to Ishihara Sangyo Kabushiki Kaisha Ltd., Osaka, Japan

Division of Ser. No. 742,311, Nov. 16, 1976, Pat. No. 4,106,925. This application Jul. 19, 1978, Ser. No. 926,162
Claims priority, application Switzerland, Nov. 20, 1975, 15033/75
Int. Cl.[2] H01N *9/24*
U.S. Cl. 71—116 12 Claims

1. 4-Phenoxy-α-phenoxy-alkanecarboxylic acid derivatives



wherein R_1 represents a halogen atom; and R_5 represents an OH group or an -O-cation group, said cation being a mono-or polyvalent cation of a herbicidally acceptable inorganic or organic base.

4,193,791

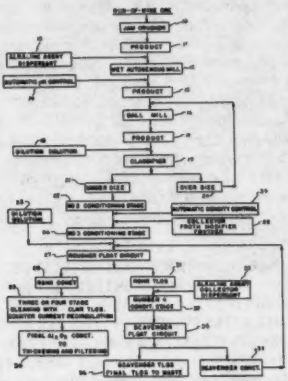
CONCENTRATION OF HYDRATED ALUMINUM OXIDE MINERALS BY FLOTATION

David Weston, Toronto, Canada, assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 736,466, Oct. 28, 1966, Pat. No. 4,113,466. This application Oct. 4, 1977, Ser. No. 838,445
The portion of the term of this patent subsequent to Sep. 12, 1995, has been disclaimed.
Int. Cl.[2] B03D *1/02*
U.S. Cl. 75—2 13 Claims

1. A process for the concentration by flotation of hydrated aluminum oxide minerals from a hydrated aluminum oxide bearing raw material comprising: subjecting the said raw material to at least three stages of conditioning prior to rougher flotation, the said at least three stages of conditioning comprising: a wet grinding circuit in which the said raw material is

reduced to flotation feed size and form a resulting pulp, and is carried out in the presence of a member selected from the group consisting of a selected dispersing agent, alkaline dispersing agent, and mixtures thereof, in controlled amounts to effectively and beneficially disperse the solids contained in said pulp; subsequently subjecting the said pulp to a mechanical agitation conditioning stage in which the said pulp is mechanically agitation conditioned in the presence of at least an alkaline dispersing agent at an optimum pH point within the range of about 9.3 to 13.0 for a sufficient period of time to precipitate deleterious salts from the said pulp and further beneficially affect the surfaces of the said aluminum oxide minerals; subsequently subjecting the said mechanically agitation conditioned pulp to a further mechanical agitation conditioning stage at an optimum pH point in the range of about 9.3 to 13.0 and in the presence of a differential activating and flocculating agent comprising one or more oxyhydryl anionic collectors including at least one or more fatty acids selected from the group consisting of oleic acid, crude oleic acid, tall oils, fish oils and mixtures thereof, to activate and flocculate the said aluminum oxide minerals; subsequently subjecting the said conditioned pulp to flotation to produce a rougher concentrate enriched in the said aluminum oxide minerals and rougher tailings impoverished in the said aluminum oxide minerals.



4,193,792

PROCESS FOR CLASS IIIB METALS ORE REDUCTION

Paul F. Taylor, P.O. Box 468, Crossville, Tenn. 38555

Filed May 3, 1978, Ser. No. 902,379

Int. Cl.[2] C22B *60/00, 60/02*

U.S. Cl. 75—84 **10 Claims**

1. A method of reducing Class IIIB metal series ore oxides individually and in metal matte combinations to ingot and alloy, fuzed and nonfuzed forms, comprising the steps of:

A. Adding powdered oxides derived from Class IIIB metal ore or the individual oxides to a solution formula consisting essentially of about 24.2 parts by weight of phosphoric acid, about 0.5 parts by weight of zinc oxide, and about 1.0 part by weight of a sulfated surfactant,

B. Adding materials selected from the group consisting of sugars and starch in the approximate norm amount three-fourths of the solution formula weight,

C. Adding sodium hydroxide and others of the Classes IA and IIA Periodic metal hydroxides in the approximate norm amount three-eighths of the solution formula weight,

D. Adding calcium carbonate ($CaCO_3$) in pulverized form in the approximate norm amount one-eighth of the solution formula weight,

E. Mixing, and adding to a reduction container,

F. Applying heat to the mixture sufficient to boil off gases,

G. Applying heat to the mixture sufficient to cause combustible materials to burn,

H. Smelting the remaining material to produce Class IIIB metal ingot and matte in both fuzed and nonfuzed states.

4,193,793

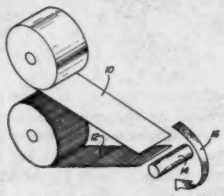
POROUS METAL-ALUMINA COMPOSITE

Harry Cheung, Buffalo, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 698,030, Jun. 2, 1976, Pat. No. 4,058,485, which is a continuation of Ser. No. 536,646, Dec. 26, 1974, abandoned. This application Nov. 9, 1977, Ser. No. 850,008

Int. Cl.[2] B01J *23/62, 23/74*

U.S. Cl. 75—235 **7 Claims**



1. A porous composite structure comprising a sintered mixture of metal particles and alumina particles characterized by the following parameters:

at least 50 weight percent of the particles in the composite are metal particles;

at least 5 weight percent of the particles in the composite are alumina particles having a surface area of at least 25 square meters per gram; and

the inter-particle porosity in the composite structure is between 5 volume percent and 60 volume percent.

5. A support structure for catalytic materials comprising the combination of a metal screen material having deposited thereon a sintered mixture of metal particles and alumina particles, characterized by the following parameters:

at least 50 weight percent of the particles in the sintered mixture are metal particles;

at least 5 weight percent of the particles in the sintered mixture are alumina particles having a surface area of at least 25 square meters per gram; and

the inter-particle porosity in the sintered mixture is between 15 volume percent and 60 volume percent.

4,193,794

LIQUID DEVELOPERS FOR ELECTROSTATIC IMAGES

Kenneth A. Metcalfe, Lockleys; Alwin S. Clements, Largs Bay, and Clive W. Wilson, Oaklands Park, all of Australia, assignors to The Commonwealth of Australia, Canberra, Australia

Continuation of Ser. No. 457,136, Apr. 1, 1974, abandoned. This application Apr. 30, 1976, Ser. No. 682,371

Claims priority, application Australia, Apr. 2, 1973, 2837/73

Int. Cl.[2] G03G *9/00*

U.S. Cl. 430—137 **6 Claims**

1. A method of producing a liquid developer for electrostatic images in which an electrically insulating carrier liquid has suspended in it a particular toner medium, which method consists of first adding a substance consisting of a polymer to a solvent adapted for being imbibed into the polymer such that the solvent is imbibed into the polymer to form a modifying carrier liquid, said polymer having a molecular weight between 2000 and 3000 and being selected from the group consisting of polyethylene and styrene-butadiene copolymer, said solvent being isoparaffinic liquid having a molecular weight between 100 and 300 and then applying the modifying carrier liquid to particles of solid toner material, the formation of the modifying carrier liquid being such that the modifying carrier

liquid is drawn into the solid toner particles and by dilatant action causes the molecular bonds of the said particles to be broken to produce a developer comprising minute developer particles suspended in said carrier liquid.

4,193,795

PHOTOGRAPHIC FILM UNITS CONTAINING A POLYMERIC MORDANT WHICH COVALENTLY BONDS WITH CERTAIN DYES

Gerald A. Campbell, Webster; Hyman Cohen, Hilton; Lewis R. Hamilton, and George Villard, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 839,879, Oct. 6, 1977, abandoned. This application May 15, 1978, Ser. No. 906,289

Int. Cl.[2] **G03C** *5/54, 1/40, 7/00, 1/84*

U.S. Cl. 430—213 **45 Claims**

42. In a process of producing a photographic transfer image in a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material, a receiving layer, a barrier associated with a neutralizing layer being permeable by said alkaline processing composition after a predetermined time and which is located between said photosensitive silver halide emulsion layer and said neutralizing layer, comprising:

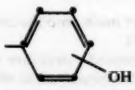
(a) treating said element with an alkaline processing composition in the presence of a silver halide developing agent to effect development of each of said exposed silver halide emulsion layers,

(i) an imagewise distribution of dye image-providing material being formed as a function of development and

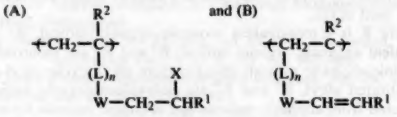
(ii) at least a portion of said imagewise distribution of dye image-providing material diffusing to said dye image-receiving layer; and

(b) neutralizing said alkaline processing composition by means of said neutralizing layer associated with said photographic element after said predetermined time;

the improvement wherein said dye image-providing material has appended thereto a moiety selected from the group consisting of ZNHR, $-SO_2NHR$ and



wherein R is H or alkyl and Z is selected from the group consisting of alkylene, arylenealkylene, cycloalkylene or with R can be taken together with the NH to complete an N containing heterocyclic group; and the receiving layer contains a polymer containing recurring units having the formula selected from the group consisting of:



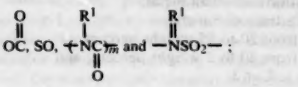
wherein

R^2 is hydrogen or alkyl;

L is a bivalent linking group., providing a linkage between the vinyl group and W, selected from the group consisting of alkylene, arylenealkylene, $COOR^3$ and $CONHR^3$;

R^3 is selected from the group consisting of alkylene, arylene and arylenealkylene;

W is an electron-withdrawing group selected from the group consisting of SO_2, CO,



m is 1 or 2;

n is 0 or 1;

with the proviso that when n is 0, W is SO_2 or

and

X is a leaving group which can be displaced by nucleophiles or eliminated in the form of HX by treatment with base, said dye or dye precursor and said recurring units forming a covalent bond on contact.

4,193,796

POLYMERS FOR USE IN IMAGE RECEIVING ELEMENTS FOR METALLIZABLE DYES IN IMAGE TRANSFER FILM UNITS

Gerald A. Campbell; Lewis R. Hamilton, and David P. Brust, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 20, 1978, Ser. No. 971,620

Int. Cl.[2] **G03C** *5/54, 1/40, 1/76, 3/00*

U.S. Cl. 430—227 **38 Claims**

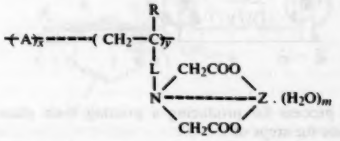
31. In a process of producing a photographic transfer image in a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a chelating dye or dye precursor and an image-receiving layer comprising:

(a) exposing and treating said element with an alkaline processing composition in the presence of a silver halide developing agent to effect development of each of said exposed silver halide emulsion layers;

(1) an imagewise distribution of dye or dye precursors being formed as a function of development; and

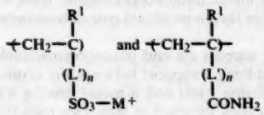
(2) at least a portion of said imagewise distribution of dye or dye precursor diffusing to said dye image-receiving layer;

the improvement wherein said dye image-receiving layer comprises a polymer having the formula:



wherein:

(A) is selected from the group consisting of:



R and R^1 are independently H, halogen or alkyl containing from 1 to 6 carbon atoms;

L and L' are independent linking groups;

n is 0 or 1;

M is selected from the group consisting of H, an ammonium cation and alkali metal;
Z is a transition metal;
x is from 20 to 95 weight percent;
y is from 80 to 5 weight percent; and
m is 1, 2 or 3.

4,193,797

METHOD FOR MAKING PHOTORESISTS

Abraham B. Cohen, Springfield, and Robert B. Heiart, Middletown, both of N.J., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 126,925, Mar. 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 833,740, Jun. 16, 1969, abandoned, which is a continuation-in-part of Ser. No. 602,291, Dec. 16, 1966, Pat. No. 3,547,730. This application Nov. 22, 1972, Ser. No. 308,856
Int. Cl. G03c *5/00*
U.S. Cl. 430—258 **16 Claims**

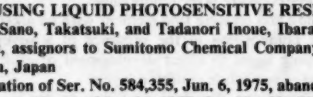
1. A process for forming a positive photoresist on a surface which comprises:
(1) applying to said surface the surface of a solid, unexposed, positive-working, photosensitive layer comprised of a resist-forming photosoluble or photodesensitizable composition, the other surface of the layer having adhered thereto with low to moderate adherence a thin, flexible, polymeric film support; then in either order,
(2) exposing the layer, imagewise, to actinic radiation to form an image,
(3) stripping the film support from the resulting image-bearing layer; and then,
(4) washing away the exposed areas of the layer to form a positive resist image of thermoplastic material.

4,193,798

PROCESS FOR PRODUCING PRINTING RESIN PLATES USING LIQUID PHOTOSENSITIVE RESINS

Takezo Sano, Takatsuki, and Tadanori Inoue, Ibaragi, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 584,355, Jun. 6, 1975, abandoned. This application May 31, 1977, Ser. No. 801,789
Claims priority, application Japan, Jun. 21, 1974, 49-71480
Int. Cl.[2] G03C *5/00*; G03B *27/04*
U.S. Cl. 430—300 **5 Claims**



1. A process for producing a printing resin plate which comprises the steps of
placing a negative film on a transparent plate positioned on a frame stand having a pair of horizontally separated spacers;
applying a transparent cover film on said negative film;
applying a liquid photopolymerizable resin on said cover film within the limits of said pair of horizontally separated spacers;
applying a support on said photopolymerizable resin layer by introducing a support between the resulting assembly on said frame stand and a means having a belt that has been extended between at least two rolls thus having an upper surface and a lower surface and which can rotate synchronously with said frame stand and (1) moving said resulting assembly on said frame stand or (2) moving said means having a belt or (3) moving said resulting assembly on said frame stand and said means having a belt together, so that the assembly on said frame stand is moved to below the lower surface of the belt while pressing the support with the lower surface of the belt by the downward pressure thereof, thereby closely adhering the support onto said photopolymerizable resin layer;
exposing said liquid photopolymerizable resin layer to light;
removing the resulting photopolymerizable resin plate from said frame stand, and
removing the unexposed areas from the resulting photopolymerized resin layer.

4,193,799

METHOD OF MAKING PRINTING PLATES AND PRINTED CIRCUIT

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 732,421, Oct. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 703,860, Jul. 9, 1976, abandoned. This application May 19, 1978, Ser. No. 907,791
Int. Cl.[2] G03C *5/00, 1/68*
U.S. Cl. 430—319 **2 Claims**

1. A method for making a circuit board which comprises
(1) contacting a film made by casting a solution of a curable composition to a copper clad laminate to produce a composite structure, where the curable composition comprises by weight
(A) 0.5% to 98% of epoxy resin,
(B) 0.5% to 98% of polyvinyl acetal,
(C) 0.1% to 10% of aromatic onium salt, where the sum of (A), (B) and (C) is 100% and (C) is selected from an aromatic halonium salt or mixtures thereof of the formula

$$[(R)_a(R^1)_bD]_c^{+}[MQ_d]^{-(d-e)}$$

an aromatic onium salt of a Group Va element of the formula,

$$[(R)_f(R^2)_g(R^3)_hE]_c^{+}[MQ_d]^{-(d-e)}$$

and an aromatic onium salt of a Group VIa element of the formula,

$$[(R)_f(R^4)_k(R^5)_mG]_c^{+}[MQ_d]^{-(d-e)}$$

(2) placing a contract mask onto the cast film of the composite structure of (1),
(3) exposing the composite structure of ultraviolet light to effect the cure of exposed areas of the cast film of the composite structure of (1),
(4) developing the resulting exposed composite structure of (1) to produce a copper-clad laminate protected by a negative photoresist of the contact mask in (2),
(5) etching the copper-clad laminate to effect the removal of exposed areas of copper therefrom, and
(6) removing the negative photoresist from the resulting copper-clad laminate to produce a circuit board comprised of copper patterned as a positive image of the mask used in (2),
where R is a monovalent aromatic organic radical, R^1 is a divalent aromatic organic radical, R^2 and R^4 are monovalent organic aliphatic radicals selected from alkyl, cyclo alkyl and substituted alkyl, R^3 and R^5 are polyvalent organic radicals selected from aliphatic radicals and aromatic radicals forming a heterocyclic or fused ring structure with E or G, E is a Group Va element selected from N, P, As, Sb and Bi, G is a group VIa element selected from S, Se and Te, M is a metal or metalloid, Q is a halogen radical,
"a" is a whole number equal to 0 or 2,
"b" is a whole number equal to 0 or 1, and the sum of "a"+"b" is equal to 2 or the valence of D,
"f" is a whole number equal to 0 to 4 inclusive,
"g" is a whole number equal to 0 to 2 inclusive,
"h" is a whole number equal to 0 to 2 inclusive and the sum of "f"+"g"+"h" is a value equal to 4 or the valence of E,

"j" is a whole number equal to 0 to 3 inclusive,
"k" is a whole number equal to 0 to 2 inclusive, and
"m" is a whole number equal to 0 or 1, where the sum of "j"+"k"+"m" is a value equal to 3 or the valence of G,

$$c = d - e,$$

e is equal to the valence of M and is an integer equal to 2-7 inclusive, and
d>e and is an integer having a value up to 8.

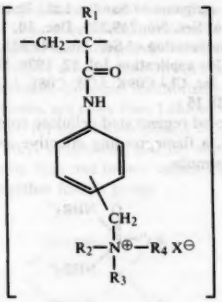
4,193,800

PHOTOGRAPHIC DYE MORDANT

Hideaki Iwama; Mikio Koyama; Yasuo Tsuda, and Masao Asano, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1978, Ser. No. 952,816
Claims priority, application Japan, Oct. 24, 1977, 52-127794; Aug. 8, 1978, 53-96462
Int. Cl.[2] G03C *5/54, 1/40;* C03C *17/06, 21/00*
U.S. Cl. 430—213 **25 Claims**

16. A photographic element for use in color diffusion transfer process which comprises in sequence a support, an image receiving layer containing a mordant, a reflecting-agent-containing layer, an opacifying-agent-containing layer, and at least one light-sensitive silver halide emulsion layer having associated therewith an image dye-providing material and wherein said mordant is a polymer containing at least 10 mole percent of a repeating unit of the formula:



wherein R_1 represents a hydrogen atom or a methyl group; R_2, R_3 and R_4 each represent an alkyl group, an aralkyl group, a cycloalkyl group or a cycloalkylalkyl group; and $X^{\oplus}$ represents a monovalent anion.

4,193,801

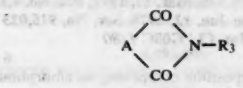
PROCESS FOR PRODUCING PHOTOGRAPHIC SILVER HALIDE MATERIAL

Howard R. Hopwood, Chelmsford, and Roy Trunley, Rayleigh, both of England, assignors to Ciba-Geigy Aktiengesellschaft, Basel, Switzerland

Continuation of Ser. No. 817,462, Jul. 19, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 965,965
Claims priority, application United Kingdom, Jul. 29, 1976, 31584/76; Jul. 29, 1976, 31783/76
Int. Cl.[2] G03C *1/84, 1/40*
U.S. Cl. 430—570 **11 Claims**

1. A process for preparing photographic material containing coated on a photobase at least one silver halide emulsion layer which contains at least one water-insoluble photographic additive selected from the groups consisting of optical sensitizing dyes, stabilizers, anti-foggants, color couplers and acutance dyes which process comprises the steps of:

(a) forming the photographic additive composition by preparing a melt of an organic compound which is water soluble to the extent of at least 3 g/litre and which has a melting point of between 30° C. and 200° C., adding to the melt the water-insoluble photographic additive, which consititutes from 1 to 80% by weight of the photographic additive composition, and which additive is soluble in said melt, to dissolve therein and allowing the melt to cool to form a solid, the water-soluble organic compound being an acid imide or its derivative of the formula



wherein A represents —CH=CH— or $(CH_2)_n$, n is 1 to 6, A is optionally substituted by OH, NH_2, halogen, hydroxyalkyl of 1 to 3 carbon atoms and R_3 represents H, OH or hydroxyalkyl of 1 to 3 carbon atoms or erythrite, D-fructose, maltose, xylite, sorbitol and mannitol,

(b) either adding the solid photographic additive composition directly to an aqueous gelatino silver halide or

(c) dissolving the solid photographic additive composition in the minimum amount of water or an organic solvent and adding this concentrated solution to a gelatino silver halide emulsion and

(d) coating the aqueous gelatino silver halide emulsion as a layer on a photographic base and drying the layer.

4,193,802

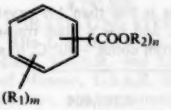
SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING AROMATIC ESTER SOLVENT

Yasuo Mukunoki; Hideki Naito, and Akio Mitsui, all of Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

Filed Aug. 15, 1978, Ser. No. 933,925
Claims priority, application Japan, Aug. 16, 1977, 52/98050
Int. Cl.[2] G03C *1/10, 1/40, 1/48, 1/06*
U.S. Cl. 430—139 **16 Claims**

1. A silver halide photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer with the photographic light-sensitive material having a hydrophilic organic colloid layer containing a dispersion of a scarcely water-soluble photographic additive dissolved in an aromatic ester represented by the following general formula (I):

(I)



wherein R_1 represents an alkyl group, an alkoxy group, an acyloxy group, an aryloxy group, an alkoxycarbonyl group or a halogen atom; R_2 represents a cyclic saturated hydrocarbon group; m represents an integer of 0 to 5; n represents an integer of 1 to 6; and when m and n each represents an integer of 2 or more, the substituents represented by R_1 or R_2 can be the same or different.

6. The silver halide photographic light-sensitive material as claimed in claim 1, wherein said scarcely water-soluble photographic additive is a photographic coupler, an antioxidant, a fade preventing agent, a hardener, an oil-soluble filter dye, an oil-soluble ultraviolet absorbing agent, a fluorescent brightening agent, a development inhibitor releasing compound, a developing agent, a diffusible dye releasing coupler, a diffusible dye releasing redox compound or a dye developing agent.

4,193,803

AMORPHOUS POLYESTER ADHESIVES FOR PHOTOGRAPHIC MATERIALS COMPRISING PHTHALIC ACID, LINEAR AND BRANCHED ALIPHATIC GLYCOL COMPONENTS

Mohammad A. Sandhu, Webster, and Kenneth L. Tingler, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 778,635, Mar. 17, 1977, Pat. No. 4,113,493. This application Jun. 12, 1978, Ser. No. 915,023

Int. Cl.[2] G03C *1/80*

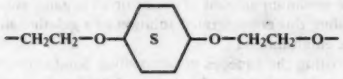
U.S. Cl. 430—627 **6 Claims**

1. An adhesive composition comprising an amorphous polyester capable of remaining amorphous at temperatures above about 20° C., comprising:

(a) an acid component comprising at least one phthalic acid derivative and

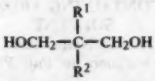
(b) a glycol component comprising:

(i) from about 15 to about 85 mole percent of at least one linear aliphatic glycol having the structure HO—R—H wherein R is selected from the group consisting of:



and $-CH_2CH_2O-_n$ wherein n is an integer of from 2 to 4, and

(ii) from about 85 to about 15 mole percent of at least one branched aliphatic glycol having the structure:



wherein R^1 and R^2 are alkyl; wherein the polyester is less than 1% crystalline and soluble in halogenated solvents and has a glass transition temperature within the range of from about −30° C. to about +50° C.

6. An adhesive composition comprising an amorphous polyester capable of remaining amorphous at temperatures above about 0° C., comprising:

(a) an acid component which is terephthalic acid and

(b) a glycol component comprising:

(i) from about 40 to about 60 mole percent of diethylene glycol and

(ii) from about 60 to about 40 mole percent of neopentyl glycol;

wherein the polyester is less than 1% crystalline, soluble in halogenated solvents, and has a glass transition temperature within the range of from about −30° C. to about +50° C.

4,193,804

PROCESS FOR PREPARING A COMPOSITION FOR A THERMALLY DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Shinpei Ikenoue, and Takao Masuda, both of Osaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

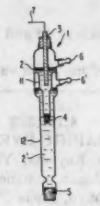
Filed Jul. 25, 1978, Ser. No. 928,025

Claims priority, application Japan, Jul. 26, 1977, 52-89481

Int. Cl.[2] G03C *1/02, 1/72*

U.S. Cl. 430—353 **27 Claims**

1. In a process for preparing a composition for use in a thermally developable light-sensitive material, which comprises reacting (a) an organic silver salt with (b) a compound capable of releasing a halogen atom or a radical containing halogen by mixing a dispersion of component (a) and a dispersion or solution of component (b) to form a reaction solution mixture of the organic silver salt and a silver halide wherein the improvement the reaction of component (a) with component (b) is carried out while controlling the oxidation-reduction potential of the reaction solution, such that the potential does not fall outside a certain pre-determined range



from the beginning of addition of component (b) to component (a) to the end of the said addition, whereby silver halide grains of a controlled grain size and a narrow grain size distribution are obtained due to the control of the oxidation-reduction potential.

4,193,805

FLAME RETARDANT REGENERATED CELLULOSE CONTAINING A PHOSPHORIC ACID OR THIOPHOSPHORIC ACID AMIDE

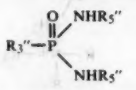
Claudine Mauric, Basel, and Rainer Wolf, Allschwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 749,379, Dec. 10, 1976, abandoned, which is a continuation of Ser. No. 549,933, Feb. 14, 1975, abandoned. This application Jul. 12, 1978, Ser. No. 923,961

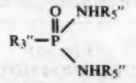
Int. Cl.[2] C09K *3/28*; C08L *1/24*

U.S. Cl. 106—18.15 **17 Claims**

1. Flameproofed regenerated cellulose containing, as flameproofing agent, a flameproofing effective amount of a compound of the formula



said flameproofed regenerated cellulose having been produced by regenerating cellulose from a cellulose-containing medium containing said flameproofing agent of the formula

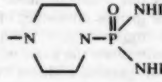


wherein

R_5'' is unsubstituted phenyl; or phenyl substituted by 1 or 2 chloro substituents, provided that not more than 1 chloro substituent is in an ortho-position; and

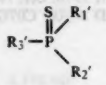
R_3'' is a group

or a group

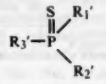


wherein R_5'' is as defined above.

8. Flameproofed regenerated cellulose containing, as flameproofing agent, a flameproofing effective amount of a compound of the formula



said flameproofed regenerated cellulose having been produced by regenerated cellulose from a cellulose-containing medium containing said flameproofing agent of the formula



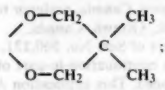
either, R_1' and R_2' are each, independently,

wherein

R_4' is hydrogen or C_1–C_3 alkyl; and

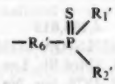
R_5' is C_1–C_6 alkyl; cyclohexyl; unsubstituted phenyl; or phenyl substituted by 1 or 2 substituents selected from bromo, chloro and C_{1-2} alkyl, with the provisos that: (a) when substituted phenyl contains a bromo substituent, such substituent is in the para-position, (b) when substituted phenyl contains 2 chloro substituents, not more than 1 chloro substituent is in an ortho-position, (c) substituted phenyl contains not more than one C_{1-2} alkyl substituent, and (d) substituted phenyl contains not more than one bromo substituent;

or R_1' and R_2' together form a group



and R_3' is a group

wherein R_4' and R_5' are as defined above; or a group



wherein

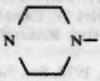
R_1' and R_2' are as defined above, and

R_6' is a group

—NH—R_7'—NH—

wherein R_7' is C_2–C_6 straight chain alkylene or 1,4-phenylene;

or a group



with the proviso that when any R_4' is C_2 or C_3 alkyl, then R_5' of the same amino group is C_{1-6} alkyl.

4,193,806

VISCOSITY INCREASING ADDITIVE FOR PRINTING INKS

Claude M. Finlayson, Houston, Tex., assignor to N L Industries, Inc., New York, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,403
Int. Cl.[2] C09D *11/02*
U.S. Cl. 106—20 **16 Claims**

1. A printing ink comprising an organic ink vehicle having dispersed therein an ink coloring material and an organophilic clay gellant comprising the reaction product of a smectite-type clay having a cation exchange capacity of at least 75 milliequivalents per 100 grams of clay and a methyl benzyl dialkyl ammonium compound or a dibenzyl dialkyl ammonium compound wherein the alkyl groups contain 14 to 22 carbon atoms and the amount of said ammonium compound reacted with said clay being from 100 to 120 milliequivalents per 100 grams of clay based upon 100% active clay.

4,193,807

OPTICAL GLASS

Kazufumi Ishibashi, Sagamihara, and Takeo Ichimura, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 30, 1978, Ser. No. 956,067
Claims priority, application Japan, Oct. 31, 1977, 52-129671
Int. Cl.[2] C03C *3/16*
U.S. Cl. 106—47 Q **7 Claims**

1. Optical glass having a refractive index (ηd) range from 1.75 to 2.13 and Abbe number (νd) range from 17 to 28, consisting essentially of the following in % by weight:

Component	Weight Percent
P_2O_5	11–32
PbO	34–60
Nb_2O_5	22–50

4,193,808

ENAMEL FOR COATING STEEL ARTICLES

Lev G. Khodsky; Alla I. Brazgovskaya; Valentina S. Kaminskaya, all of Minsk, U.S.S.R., and Evgeny N. Podkletnov, deceased, late of Moscow, U.S.S.R. (by Vera M. Malkina, Evgeny E. Podkletnov, administrators), assignors to Institut Obschei i Neorganicheskoi Khimii Akademii Nauk Belorusskoi SSR, U.S.S.R.

Filed Mar. 2, 1977, Ser. No. 773,753
Int. Cl.[2] C03C *3/04, 7/02*
U.S. Cl. 106—48 **3 Claims**

1. An enamel composition for coating steel articles, consisting essentially of comprising SiO_2, TiO_2, ZrO_2, CaF_2, Li_2O and Na_2O with the following ratio of said components, in percent by weight:

SiO_2	62.17 to 72.29
TiO_2	0.2 to 9.54
ZrO_2	0.5 to 9.9
CaF_2	2.4 to 6.6
Li_2O	0.3 to 5.06
Na_2O	10.48 to 19.05

4,193,809

HIGH-STRENGTH CONCRETE OBJECTS

Richard L. Ferm, and Robert W. Campbell, both of Lafayette, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 31, 1978, Ser. No. 938,665
Int. Cl.[2] C04B 7/02
U.S. Cl. 106—97 7 Claims

1. A process for producing a portland cement concrete object of increased strength by impregnating the object with an aqueous solution of alkali metal or an alkaline earth metal polysulfide and heating the object at a temperature between 110° C. and 180° C. for at least 0.1 hour.

4,193,810

CONCRETE COMPOSITION

Richard L. Ferm, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 31, 1978, Ser. No. 938,667
Int. Cl.[2] C04B 7/02
U.S. Cl. 106—97 5 Claims

1. A process for producing a portland cement concrete article of increased strength by impregnating the article with an aqueous solution of an alkali metal or alkaline earth metal polysulfide.

4,193,811

CONCRETE COMPOSITION

Richard L. Ferm, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 31, 1978, Ser. No. 938,668
Int. Cl.[2] C04B 7/02
U.S. Cl. 106—97 8 Claims

1. A concrete composition comprising a major portion of aggregate, from about 6 to 15% by weight portland cement based on aggregate, and from 1.5 to 6% based on aggregate of an alkali metal or alkaline earth metal polysulfide.

4,193,812

PLASTER OBTAINED FROM PHOSPHOGYPSUM AND ITS PROCESS OF OBTENTION

Jean-Pierre Caspar, Le Teil, and Bernard Lelong, Montellimar, both of France, assignors to Lafarge, Paris, France

Filed Apr. 12, 1978, Ser. No. 895,763
Claims priority, application France, Apr. 29, 1977, 77 12963
Int. Cl.[2] C04B 11/00
U.S. Cl. 106—110 12 Claims

1. A process for preparing plaster from phosphogypsum which comprises: contacting the phosphogypsum with from about 0.8 to 4.0% of a calcium source to react with the syncrystalline impurities in the phosphogypsum during a heat treatment which comprises:

(a) dehydrating the phosphogypsum by heating at a temperature of from 110° C. to 150° C. for from about 30 to 90 minutes and

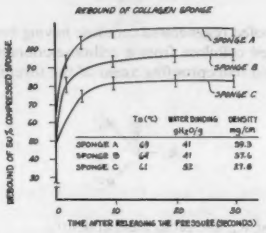
(b) conditioning the phosphogypsum product of step (a) by heating at 130° C. to 180° C. for at least 10 minutes under a H_2O partial pressure of at least 100 Torrs.

4,193,813

METHOD FOR MAKING COLLAGEN SPONGE

Milos Chvapil, Tucson, Ariz., assignor to Medi-Coll, Inc., Phoenix, Ariz.

Filed Sep. 7, 1976, Ser. No. 720,563
Int. Cl.[2] B29D 27/00; C07G 7/00, 7/06
U.S. Cl. 106—122 12 Claims



1. In a method of making a collagenous product wherein comminuted collagen is suspended in water and formed into a homogeneous slurry, the improvement comprising: in the folowing sequence

(a) adjusting the pH of said slurry to from pH 3.5 to pH 6.5;

(b) adding from 0.5% to 1% of an aldehyde based on the total volume of said slurry;

(c) freezing said slurry at a temperature of from 0° centigrade to −20° centigrade;

(d) thawing said slurry to form collagenous sponge; and

(e) immersing said sponge in a reducing wash having a pH of from 8 to 9 containing sufficient reducing agent to create excess reducing equivalents for a time, and at a temperature sufficient to reduce the existing double bond Schiff base to a single bond.

4,193,814

BINDING LIGNOCELLULOSIC MATERIALS

Kuo-Cheng Shen, Ottawa, Canada, assignor to Canadian Patents & Development Ltd., Ottawa, Canada

Continuation-in-part of Ser. No. 560,131, Mar. 20, 1975, abandoned, which is a continuation-in-part of Ser. No. 338,562, Mar. 6, 1973, abandoned. This application Apr. 21, 1978, Ser. No. 898,671
Int. Cl.[2] C08L 97/02
U.S. Cl. 106—123 LC 5 Claims

1. A method of making a thermosetting binder for lignocellulosic materials, comprising treating a concentrate of spent sulfite liquor with sufficient sulfuric acid to produce a lignosulfonic acid content of not less than 0.8 milliequivalent weight of NaOH per gram of spent sulfite liquor solids, the amount of sulfuric acid being not substantially greater than that required to release all the available lignosulfonic acid.

4,193,815

GILSONITE EMULSION COMPOSITIONS

Michael V. Burris, 723 S. Third St., Las Vegas, Nev. 89101

Filed Jun. 5, 1978, Ser. No. 912,357
Int. Cl.[2] C08L 1/00, 95/00; C09D 3/24
U.S. Cl. 106—202 8 Claims

1. An emulsion composition consisting essentially of

(a) a gilsonite phase consisting of a mixture of between about 33 and about 95% gilsonite, and a petroleum hydrocarbon having a boiling point above about 450° F. selected from the group consisting of diesel oil, gas oil, lubricating oil and asphalt, and

(b) a water phase consisting essentially of water and between about 0.05 and about 5%, by weight, of an emulsifying

agent and wherein the gilsonite:water phase ratio is between about 1:2 and about 3:1, respectively, by weight.

4,193,816

QUICK-SETTING BITUMINOUS EMULSION COMPOSITIONS

Richard L. Ferm, Lafayette, and Chester C. Latif, Turlock, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 672,746, Oct. 4, 1967, abandoned, and a continuation-in-part of Ser. No. 757,137, Sep. 3, 1968, abandoned, and a continuation-in-part of Ser. No. 68,502, Aug. 31, 1970, abandoned. This application May 22, 1972, Ser. No. 255,604

Int. Cl.[2] C08L *95/00*

U.S. Cl. 106—277 **8 Claims**

1. A surfacing composition which rapidly sets to a tough cohesive surface with early development of tensile strength and rain resistance and is prepared by intimately mixing a solid particulate matter, a bituminous emulsion and a set initiator in the following proportions: 100 parts by weight of said solid particulate matter; 0.1 to 5 parts by weight of said set initiator which is Portland cement, hydrated lime or mixtures thereof; and from about 5 to 100 parts of said bituminous emulsion comprising from about 50 to 70 weight percent of an asphalt and from about 0.1 to about 3 weight percent of an anionic emulsifying salt of a hydrocarbyl sulfonic acid of the formula:

wherein R^1 is alkyl or alkenyl of from 10–20 carbon atoms.

4,193,817

PRODUCTION OF BOTTLER'S LIQUID SUGAR

Terry R. Dillman, and Dennis J. Burke, both of Rockford, Ill., assignors to Illinois Water Treatment, Rockford, Ill.

Filed Mar. 22, 1979, Ser. No. 22,586

Int. Cl.[2] C13D *3/14*; B10D *15/06*; B01J *1/09*

U.S. Cl. 127—46 A **20 Claims**

1. A process for production of bottler's liquid sugar essentially from brown sugar derived from cane sugar and crystallized in one or more intermediate strikes from sugar liquors comprising the steps of

(a) remelting the crystallized product of one or more intermediate strikes,

(b) filtering the remelted product, and

(c) passing the filtered product in contact with chloride form of Type-1 strong-base anion-exchange resin.

17. In a process for decolorization of sugar solutions by contact with chloride form of Type-1 strong-base anion-exchange resin, an improvement wherein decolorization is carried out at about 30° C., wherein the resin is regenerated by an aqueous solution of hydrochloric acid followed by an aqueous solution of sodium chloride, and wherein the aqueous solution of sodium chloride also contains a member selected from the group consisting of sodium hydroxide, potassium hydroxide, ammonium hydroxide, and mixtures thereof.

4,193,818

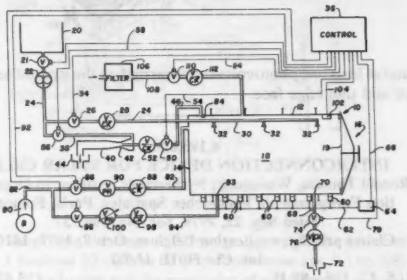
COMBINED ULTRASONIC CLEANING AND BIOCIDAL TREATMENT IN A SINGLE PRESSURE VESSEL

Jack H. Young, Crawford; David A. Karle, and Frank E. Halleck, both of Erie, all of Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed May 5, 1978, Ser. No. 903,249

Int. Cl.[2] B08B *3/12*

U.S. Cl. 134—1 **18 Claims**



1. Method for combined ultrasonic washing and biocidal treatment of articles, such as surgical instruments, comprising

providing a sealable chamber capable of operating at pressures other than atmospheric including both positive pressures and vacuum levels in excess of 15" Hg. and defined by a unitized shell main body portion,

placing an article to be ultrasonically cleaned and biocidally treated in such chamber and sealing the chamber,

admitting an ultrasonic washing liquid into the shell chamber,

controlling such washing liquid admission to cover the article to be cleaned,

evacuating the chamber to expose the washing liquid to a deep vacuum in excess of about 15" Hg.,

transmitting ultrasonic energy through such unitized shell while maintaining such deep vacuum during at least a portion of the time that ultrasonic energy is transmitted into the washing liquid,

such ultrasonic energy being transmitted by energizing a plurality of transducers secured to such unitized shell externally of such chamber to achieve desired degassing of and cavitation in such washing liquid to ultrasonically clean the article,

releasing the vacuum in the chamber,

draining the washing liquid from the chamber, and

admitting a biocidal fluid into the chamber to provide desired biocidal treatment of such article.

4,193,819

LUMINESCENT PHOTOVOLTAIC SOLAR COLLECTOR

Peter G. Wohlmut, Palo Alto, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

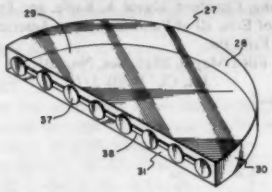
Filed Jun. 23, 1978, Ser. No. 918,220

Int. Cl.[2] H01L *31/04*

U.S. Cl. 136—89 PC **8 Claims**

1. A photovoltaic array comprising a luminescent member having a pair of flat, opposed essentially parallel semicircularly

shaped sides, each of said sides being joined by a thin edge face having a curved, semicylindrical section and a straight section



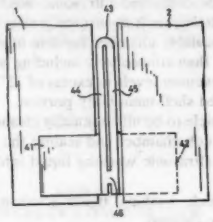
and at least one photovoltaic cell carried on the straight section of said thin edge face.

4,193,820

INTERCONNECTION DEVICE FOR SOLAR CELLS

Ronald Thomas, Wassenaar, Netherlands, assignor to Organisation Europeenne de Recherches Spatiales, Paris, France

Filed Sep. 22, 1978, Ser. No. 994,737
Claims priority, application Belgium, Oct. 7, 1977, 181550
Int. Cl.[2] H01L *31/00*
U.S. Cl. 136—89 P **3 Claims**



1. In a solar panel comprising a plurality of spaced apart planar solar cells arranged on at least one face of a supporting plate, an interconnection device for interconnecting adjacent solar cells each having an upper and a lower surface, said interconnection device comprising:

a pair of flat strips of electro-conducting material, a first of said flat strips attached to the upper surface of a first solar cell and the second of said flat strips attached to the lower surface of a second solar cell; and

a hinge element of electro-conducting material having a U-shape and extending lengthwise in the gap between the pair of solar cells in a slant plane relative to the plane of the pair of solar cells, the end portions of said hinge element being connected each to a respective one of said flat strips.

4,193,821

FABRICATION OF HETEROJUNCTION SOLAR CELLS BY IMPROVED TIN OXIDE DEPOSITION ON INSULATING LAYER

Tom Feng, Morris Plains, and Amal K. Ghosh, New Providence, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

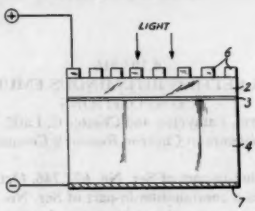
Continuation-in-part of Ser. No. 933,563, Aug. 14, 1978, abandoned. This application Mar. 12, 1979, Ser. No. 19,827
Int. Cl.[2] H01L *27/14, 31/00, 29/48*
U.S. Cl. 148—1.5 **12 Claims**

1. A process for forming a tin oxide semiconductor heterojunction solar cell comprising:

providing an N-type silicon substrate having a resistivity less than about 10 ohm-cm;

depositing an insulating layer on the surface of said silicon substrate, said insulating layer being selected from the group consisting of SiO_2, Si_3N_4, GeO_2, Al_2O_3 and TiO_2;

heating said substrate to provide a substrate surface temperature in the range of about 300° C. to about 400° C.; and



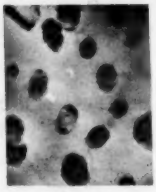
contacting said heated substrate in the presence of air with an atomized liquid solution of tin tetrachloride and an organic ester having a boiling point below about 250° C. while continuing said heating, said contacting being for a time sufficient to deposit a conductive coating of tin oxide on the substrate.

4,193,822

HIGH STRENGTH ALUMINIUM BASE ALLOYS

Colin M. Adam, Camp Hill, and Clive G. Bennett, East Doncaster, both of Australia, assignors to Comalco Aluminium (Bellbay) Limited, Tasmania, Australia

Filed Jul. 7, 1978, Ser. No. 922,640
Claims priority, application Australia, Jul. 15, 1977, PD 0865
Int. Cl.[2] C22F *1/04*
U.S. Cl. 148—3 **6 Claims**



4. In a method of casting aluminum-iron alloy from a melt with a controlled temperature gradient between the solid and liquid metal and with a controlled rate of growth of the alloy phases as they solidify, said alloy consisting essentially of aluminum and about 0.5 to 5% by weight of iron, the improvement which comprises providing in said melt about 0.1 to 6.0% magnesium, about 0.0 to 3.0% copper, about 0.5 to 10% zinc and about 0.0 to 1.0% manganese, to improve the stiffness and strength of said alloy by producing in said alloy the metallurgical microstructure consisting essentially of cells of Al-Al_6Fe eutectic, wherein the Al_6Fe phase is present in the form of fibers, in combination with precipitates due to precipitation hardening.

4,193,823

ROLLS FOR HOT-ROLLING NON-FERROUS METALS AND METHOD OF MAKING

Robert S. Linne, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Division of Ser. No. 776,796, Mar. 11, 1977, Pat. No. 4,106,319. This application Dec. 21, 1977, Ser. No. 862,895
Int. Cl.[2] B21B *27/00;* B23P *9/02;* C21C *1/74*
U.S. Cl. 148—6.35 **15 Claims**

1. An improved method of making a work roll for a hot-rolling mill of the type used for rolling non-ferrous metal and generally comprising the steps of: providing a steel alloy bar

having a chromium content of about 4.0 to 6.0 percent; and machining said bar into a work roll having a predetermined shape; and heat-treating said work roll, to harden said steel alloy, by heating the roll to an elevated temperature then cooling the roll in a controlled atmosphere;

wherein the improvement comprises:

heat treating the roll by heating the roll to an elevated temperature in a controlled atmosphere then cooling the roll in an oxidizing atmosphere to harden said steel alloy and to form a dense, tightly-adherent oxide surface scale on at least the working surfaces of said work roll, which scale serves, during subsequent use for hot-rolling, to improve the average life of the roll; and

maintaining said surface scale on at least said working surfaces of said roll during any subsequent finish machining operations.

4,193,824

METHOD FOR MANUFACTURING STEEL SPRING LEAVES

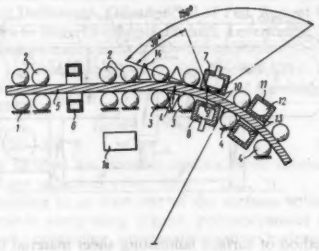
Viktor P. Egorov, Vostryakovsky proezd, 11, korpus 1, kv. 226; Viktor A. Ognevsky, Sumskoi proezd, 15, korpus 2, kv. 279; Anatoly G. Orlovsky, Avtozavodskaya ulitsa, 7, kv. 81; Grigory A. Ostrovsky, Raketny bulvar, 10, kv. 47; Alexandr M. Ryskind, Kirovogradskaya ulitsa, 24, korpus 1, kv. 161; Anatoly L. Stepin, Birjuleveskaya ulitsa, 5, korpus 2, kv. 347; Oleg F. Trofimov, Chusovskaya ulitsa 11, korpus 8, kv. 92, and Isaak N. Shklyarov, Velozavodskaya ulitsa 9, kv. 24, all of Moscow, U.S.S.R.

Filed Aug. 9, 1977, Ser. No. 824,211

Claims priority, application U.S.S.R., Aug. 18, 1976, 2385501; Aug. 18, 1976, 2385502

Int. Cl.[2] C21D *7/14*

U.S. Cl. 148—12.4 **3 Claims**



1. A method of manufacturing spring leaves, comprising the successive steps of: heating each spring leaf by induction heating to a hardening temperature; bending each heated spring leaf; cooling each spring leaf to ensure hardening with subsequent self-tempering; hardening the surface of each spring leaf to a depth of about one tenth to about three tenths part of its gauge on at least one of its sides, by surface induction heating.

4,193,825

METHOD OF CARBON NITRIDING A METAL WORKPIECE

Rinzo Kojima; Kazuhiro Shibata, both of Inuyama, and Sachio Nagata, Osaka, all of Japan, assignors to Kayaba Industry Co., Ltd. and Nihon Denshi Kogyo Kabushiki Kaisha, both of, Japan

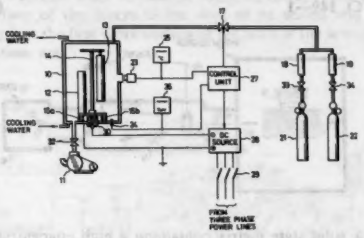
Continuation of Ser. No. 810,833, Jun. 28, 1977, abandoned. This application Jan. 2, 1979, Ser. No. 405

Int. Cl.[2] C21D *1/38*

U.S. Cl. 148—16.6 **9 Claims**

1. A method of carbon nitriding the surface of a metal workpiece comprising the steps of forming a pressurized mixture of about 1 to about 30 volume % of carbonaceous gas and the remainder of nitrogen gas, supplying said mixture to an electric discharge furnace containing said workpiece, said furnace being continuously evacuated to an internal pressure in the range from about 0.4 to about 20 Torr, heating said workpiece to a temperature in the range from about 400° C. to about 600° C. for a predetermined time, and then cooling said treated workpiece.

8. A method of carbon nitriding the surface of a metal work-



piece comprising the steps of forming a pressurized mixture of about 1 to about 30 volume % of carbonaceous gas, 0.1 to 30% volume of hydrogen and the remainder of nitrogen gas, supplying said mixture to an electric discharge furnace containing said workpiece, said furnace being continuously evacuated to a pressure of 0.4 to 20 Torr, heating said workpiece to a temperature in the range from about 400° C. to about 600° C. for a predetermined time, and then cooling said treated workpiece.

4,193,826

VAPOR PHASE DIFFUSION OF ALUMINUM WITH OR WITHOUT BORON

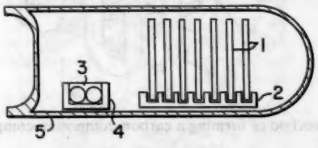
Yasuhiro Mochizuki; Hiroaki Hachino; Yasumichi Yasuda; Yutaka Misawa, and Takuzo Ogawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 7, 1978, Ser. No. 931,399

Claims priority, application Japan, Aug. 15, 1977, 52/96983

Int. Cl.[2] H01L *21/223*

U.S. Cl. 148—189 **12 Claims**



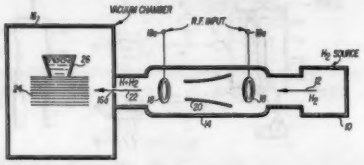
1. A method of fabricating a semiconductor device through selective diffusion of aluminum in a vapor phase into a silicon substrate by heating a sealed enclosure in which said silicon substrate and an aluminum diffusion source are disposed, wherein said selective diffusion of aluminum is carried out in a predetermined surface region of said silicon substrate with a low aluminum concentration smaller than a predetermined value and using a silicon oxide film as a diffusion mask, said silicon oxide film having apertures at said predetermined surface region of said silicon substrate, through which aluminum is selectively diffused into the silicon substrate.

4,193,827

ATOMIC HYDROGEN STORAGE

John A. Woollam, Oberlin, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 676,432, Apr. 13, 1976, Pat. No. 4,077,788.
This application Sep. 29, 1977, Ser. No. 837,794
Int. Cl.[2] C06B 47/00
U.S. Cl. 149—1 1 Claim



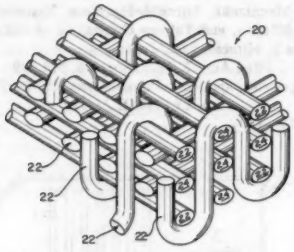
1. A solid state matrix containing a high concentration of atomic hydrogen, said matrix comprising a delaminated layered compound which is a transitional metal dichologenide of the form TX_2 where T is a transitional metal and X is S, Se or Te and cooled to liquid helium temperature in the range of from about 0° to 14° K. and having a strong magnetic field of at least 1 Tesla per degree Kelvin impressed thereon, and a monolayer of free radicals of hydrogen collected in the interstices of said layered compound exposed by the delamination of said layered compound.

4,193,828

METHOD OF FORMING CARBON COMPOSITES

Peter R. Moores, Sanford, and James E. Shoffner, Kennebunk, both of, assignors to Fiber Materials, Inc., Biddeford, Me.

Division of Ser. No. 708,929, Jul. 27, 1976, Pat. No. 4,131,708.
This application Jun. 12, 1978, Ser. No. 914,336
Int. Cl.[2] B32B 7/00
U.S. Cl. 156—148 6 Claims



1. A method of forming a carbon-composite, comprising the steps of:

providing a carbon fiber body,

implanting columns of refractory metal at selected positions within said body,

impregnating said body with a carbonizable binder material, and

heating the impregnated body under pressure so as to (1) carbonize said binder and (2) simultaneously convert said metal in situ to refractory metal carbides having (a) a melting point below the sublimation temperature of the surrounding composite and (b) a thermal expansibility having a force below the strength of the surrounding composite.

4,193,829

PROCESS FOR THE MANUFACTURE OF LOW DENSITY BIS-MALEIMIDE-CARBON MICROBALLOON COMPOSITES

Demetrius A. Kourtides, San Jose, and John A. Parker, Los Altos, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 778,195, Mar. 16, 1977, Pat. No. 4,135,019.
This application Jun. 30, 1978, Ser. No. 920,878
Int. Cl.[2] B32B 3/12
U.S. Cl. 156—276 14 Claims

1. A process for preparing composite structures comprising:

a. impregnating a ceramic fiber cloth with a bismaleimide resin;

b. curing the resin-impregnated cloth to produce a cover sheet;

c. filling a polyamide paper or a bismaleimide-glass fabric honeycomb core structure with carbon microballoons; and

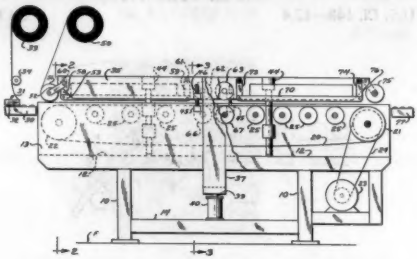
d. bonding said cover sheet to said honeycomb core structure with a bismaleimide hot melt adhesive.

4,193,830

METHOD OF SURFACE LAMINATING

James A. Milne, Wheeling, Ill., assignor to Pace Incorporated, Northbrook, Ill.

Division of Ser. No. 723,026, Sep. 13, 1976, abandoned. This application Dec. 15, 1977, Ser. No. 860,839
Int. Cl.[2] C09J 5/06, 7/00
U.S. Cl. 156—306 5 Claims



1. A method of surface laminating sheet material to a core with mechanical bond throughout an interface of surfaces of both sheet and core comprising the steps of:

registering at ambient temperature in sandwich form the core material, a high viscosity hot melt adhesive and a laminate,

advancing the sandwich past a heater for progressively raising the temperature of the adhesive from ambient to tackiness to activating temperature beginning at one edge and across the width of the sandwich and proceeding lengthwise of the sandwich under low unit pressure,

immediately advancing the sandwich under pressure rolls to migrate the adhesive when elevated to and while at said activating temperature into intimate contact with both laminate and core surfaces opposite each other in the sandwich by applying localized pressure across the sandwich urging the laminate against the core while maintaining the outer sandwich surfaces in substantial parallelism,

immediately advancing the sandwich past a cooling station for progressively cooling the sandwich under low unit pressure following said pressurizing step to reduce the temperature of the adhesive to mechanical bonding temperature beginning at said one edge of the sandwich and proceeding lengthwise thereof and maintaining the surfaces in said parallelism during said cooling.

4,193,831

WATER PROOFING COMPOSITIONS FOR CEMENT MORTAR OR CONCRETE AND METHOD EMPLOYING SAME

Toshihiro Fujii, Fukuyama, and Sekiji Yokota, Fukayasu, both of Japan, assignors to Hayakawa Rubber Company Limited, Fukuyama, Japan

Continuation of Ser. No. 668,114, Mar. 18, 1976, abandoned, which is a continuation of Ser. No. 537,014, Dec. 27, 1974, abandoned. This application Oct. 27, 1977, Ser. No. 846,051

Claims priority, application Japan, Mar. 18, 1976, 51-668114

Int. Cl.[2] **C09J** *5/00*

U.S. Cl. 156—309 **3 Claims**

1. A method of water-proofing hardened cement mortar or concrete comprising the steps of making a homogeneous mixture consisting essentially of 65–40% by weight reclaimed butyl rubber, 30–50% by weight filler, a softener and an antioxidant; rolling said mixture into a sheet having a hardness of 30–70, applying an adhesive on the hardened cement mortar or concrete, placing said sheet on the applied adhesive to adhere said sheet to said hardened cement mortar or concrete to form a water proofing roofing and applying wet mortar or concrete on said sheet to adhere said wet mortar or concrete to said sheet.

3. A water-proofing roofing sheet to be used in contact with wet cement mortar or wet concrete and having adhesion to the wet cement mortar or wet concrete without employing additional bonding materials and having a hardness of 30–70 (JIS hardness tester), which essentially consists of 65–40% by weight of reclaimed butyl rubber, 30–50% by weight of a filler, a softener and an antioxidant.

4,193,832

METHOD FOR MAKING BONDS

Artur Reischl, Leverkusen; Rudolf Hombach, Cologne, and Manfred Dollhausen, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 24, 1978, Ser. No. 899,430

Claims priority, application Fed. Rep. of Germany, May 3, 1977, 2719720

Int. Cl.[2] **C09J** *5/00*

U.S. Cl. 156—331 **14 Claims**

1. In a method for bonding one or more substrates with polyurethane adhesives comprising:

(A) applying to at least one of the surfaces to be bonded adhesives comprising organic polyisocyanates and compounds containing isocyanate-reactive hydrogen atoms which react with each other to form polyurethanes, or moisture-hardening reaction products containing free isocyanate groups or excess quantities of polyisocyanates and compounds containing isocyanate-reactive hydrogen atoms which react with each other and

(B) fitting together said surfaces to be bonded, the improvement wherein said compounds containing isocyanate-reactive hydrogen atoms are dispersions of isocyanate polyaddition products which contain terminal hydroxyl groups and primary or secondary amino groups or semicarbazide groups, in organic polyhydroxyl compounds, prepared from diisocyanates having a molecular weight of from 112 to 300 and compounds containing isocyanate-reactive groups having a functionality of at least two and a molecular weight of from 32 to 300.

4,193,833

ULTRASONIC PACKAGING MACHINE

John L. Young, Livonia, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Apr. 24, 1978, Ser. No. 899,141

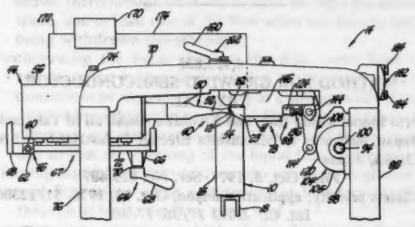
Int. Cl.[2] **B32B** *31/00;* **B31B** *1/26*

U.S. Cl. 156—358 **22 Claims**

1. An apparatus so constructed and arranged as to be capable of forming a seal between layers of a carton of thermoplastic coated paperboard material and the like in a sealant activating station wherein the thermoplastic material of the layers in the area to be sealed serves as the sealant, said apparatus comprising:

a horn fixedly secured at the activating station and having a first work surface for engaging one outer surface of the layers in the area to be sealed,

back-up means located at the sealant activating station having a second work surface for engaging the opposite outer surface of the layers in the area to be sealed and that opposes the first work surface of the horn at the activating station, and



biasing means for biasing said back-up means, moving said backup means with respect to said horn between an inactive position and an active position in which the opposed work surfaces of the horn and back-up means engage the layers to be sealed in a clamping relationship and returning to said inactive position after remaining in the active position with said horn energized a predetermined period of time sufficient to activate the thermoplastic material of said layers by generating frictional heat, said biasing means allowing said active position to vary.

4,193,834

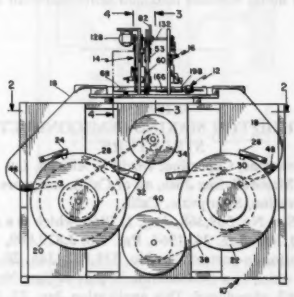
AUTOMATIC TAPING MACHINE

Carl E. Bernardi, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 19, 1978, Ser. No. 897,685

Int. Cl.[2] **B32B** *31/00;* **G03B** *1/22*

U.S. Cl. 156—521 **21 Claims**



1. An apparatus for applying a securing tape to a lead frame, said apparatus comprising:

a support surface for supporting a lead frame;

feeding means for feeding lead frames across said support surface;

a tape cutting and applying assembly disposed above said support surface and including a stationary cutting block having a fixed cutting edge, tape feeding means for feeding a tape a predetermined distance beyond said cutting edge, and a vertically movable cutting head including a movable cutting edge movable past said fixed cutting edge

for cutting a strip from a tape and applying said strip to lead frame on said support surface,

said cutting head includes a pressure face extending outward from said movable cutting edge, said grasping means comprises vacuum ports in said pressure face, and

a movable cutting gate movable into and out of a position adjacent said fixed cutting edge and including stop means for stopping said tape said predetermined distance beyond said cutting edge, and a support surface for supporting said strip of tape ahead of said cutting head until grasped by said grasping means.

4,193,835

METHOD FOR GROWING SEMICONDUCTOR CRYSTAL

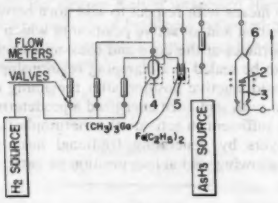
Morio Inoue; Kunio Itoh, and Kunihiko Asahi, all of Takatsuki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 5, 1977, Ser. No. 839,407

Claims priority, application Japan, Oct. 13, 1976, 51/123068

Int. Cl.[2] B01J *17/36, 17/40*

U.S. Cl. 156—606 **5 Claims**



1. A vapor phase epitaxial method for growing a semiconductor crystal comprising employing a reaction gas containing the same elements as the major elements in a semiconductor substrate and a chemical compound containing a dicyclopentadienyl metal, or derivative thereof, of a metal element to be added or doped into said semiconductor substrate, adding or doping said metal element into said semiconductor substrate.

4,193,836

METHOD FOR MAKING SEMICONDUCTOR STRUCTURE

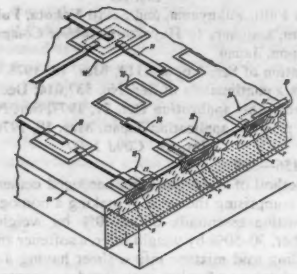
Albert P. Youmans, Cupertino; David F. Allison, Los Altos, and David A. Maxwell, San Jose, all of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 569,368, Aug. 1, 1966, which is a division of Ser. No. 391,704, Aug. 24, 1964, Pat. No. 3,829,889, which is a continuation-in-part of Ser. No. 338,802, Jan. 20, 1964, abandoned, which is a continuation-in-part of Ser. No. 330,697, Dec. 16, 1963, abandoned. This application Jan. 27, 1970, Ser. No. 6,057

Int. Cl.[2] H01L *21/306*

U.S. Cl. 156—657 **11 Claims**

7. In a method for forming a semiconductor structure, providing a semiconductor body having first and second surfaces, forming an insulating layer on the first surface on the semiconductor body, forming a support structure on the insulating layer, forming recesses in the semiconductor body extending from said second surface to the first surface to form islands in the semiconductor body, forming an insulating layer in the recesses and over the islands, forming an additional support structure upon the last named insulating layer and removing the first named support structure.



8. A method as in claim 7, together with the step of forming devices in said islands.

4,193,837

THIN LAYER EVAPORATORS

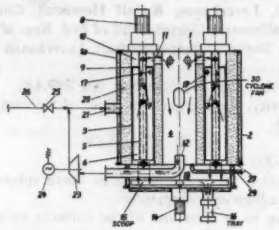
Franz J. Wyss, Uzwil, and Peter Hug, Bischofszell, both of Switzerland, assignors to Gebrueder Buehler AG, Uzwil, Switzerland

Filed May 22, 1978, Ser. No. 908,574

Claims priority, application Switzerland, Jun. 7, 1977, 6982/77

Int. Cl.[2] B01D *1/16*

U.S. Cl. 159—6 W **14 Claims**



1. A thin-layer evaporator for the drying of sludge and similar substances comprising support means, at least two evaporation cylinders respectively having vertical axes extending upward from said support means, rotors respectively mounted in said evaporation cylinders, each rotor being constructed and arranged to apply a thin layer of a substance to be dried along a major portion of the inner wall surface of its associated evaporation cylinder extending substantially from the base thereof to an upper zone within said cylinder, motor means for rotating said rotors, a vapor-collection vessel mounted laterally with respect to and spaced from said evaporation cylinders said vessel having its lateral walls substantially parallel to said axes and substantially the same height as said cylinders, vapor-collection vessel, a compressor connected to said connection conduit to compress said vapor from said collection conduit, housing means for confining a steam jacket around said evaporation cylinders and said vapor-collection vessel whereby the walls of said cylinders and vessel can be heated, and an inlet duct means connected to said compressor and said housing to direct vapors transversely of said evaporation cylinders and said vapor-collection vessel for the admission of the resultant compressed vapors as a super-heated steam into said housing means so that said evaporation cylinders and said vapor-collection vessel are exposed to said superheated steam at substantially the same time, said housing means

being constructed for division into two parts shaped to render said evaporation cylinders and vapor-collection vessel accessible when said parts are separated.

4,193,838

REMOVAL OF THERMOPLASTIC RESIN COATINGS FROM PAPERBOARD WITH HALOGENATED HYDROCARBON VAPORS

Robert J. Kelly, Oakley, and J. Frank Valle-Riestra, Walnut Creek, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 567,652, Apr. 11, 1975, abandoned. This application Jun. 11, 1976, Ser. No. 695,213

Int. Cl.[2] D21C *5/02*

U.S. Cl. 162—5 **10 Claims**

1. A process for removing a coating resin from paperstock coated therewith, comprising:

(a) maintaining a pool of hot, saturated vapors of a halogenated, acyclic hydrocarbon containing from one to three carbons and from two to eight bromine, chlorine or fluorine atoms, at least two of which are bromine or chlorine, said halogenated hydrocarbon melting at a temperature of 60° C. or less to form a liquid capable of wetting said resin and said vapors being at a temperature which is at least as high as the melting or softening point of the resin and having a density which is at least three times the density of the ambient air,

(b) placing pieces of the coated paperstock, which are at a temperature below the condensation temperature of said vapors, in said vapor pool, thereby causing formation of a continuous, off-running film of condensate on the resin,

(c) agitating together said pieces of paperstock in the vapor pool until at least a predominant proportion of said resin has been removed by the combined actions thereon of said agitation and of the vapors and condensate.

4,193,839

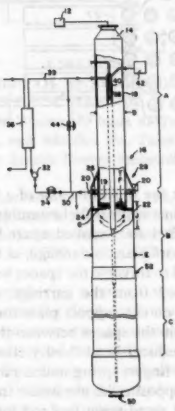
FLOW CONTROL METHOD AND APPARATUS FOR CONTINUOUS WOOD CHIP DIGESTER SCREENLESS LIQUOR EXTRACTOR

Michael I. Sherman, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed May 11, 1976, Ser. No. 685,391

Int. Cl.[2] D21C *7/14*

U.S. Cl. 162—19 **15 Claims**



1. A method for treating cellulose fiber material utilizing an inner vertically extending vessel having a diameter D and an outer vertically extending vessel having a diameter E greater than D, and a bottom portion of the inner vessel extending into the outer vessel and defining an annular liquid-filled space in the outer vessel between the innner vessel and the outer vessel, said method comprising the steps of

passing cellulose fiber material through said inner vessel into said outer vessel to establish a column of cellulose fiber material extending downwardly from the bottom portion of the inner vessel,

introducing cellulose fiber material treating liquid into said material column for treatment of said material,

preventing channeling of liquid flow through said column by establishing at least three distinct stationary flow areas of fiber material treating liquid through said column to the annular space in the outer vessel, at least two of the three distinct stationary flow areas having liquid being withdrawn therethrough from the column through the annular space, and at least one of the flow areas not having liquid being withdrawn therethrough,

withdrawing the liquid through the flow areas from the annular space in the outer vessel at a rate, relative to the dimensions of the vessels, such that a stilling well effect is created in said annular space and fiber material from said column is not entrained in liquid flow in said annular space and so that no screening of the liquid flow is necessary;

forcing liquid back into said annular space through one of said flow areas while withdrawal of liquid takes place through at least two flow areas; and

continuously switching which of the flow areas liquid is forced back into.

4,193,840

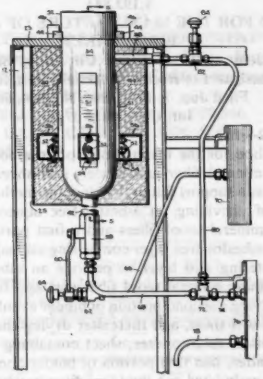
LABORATORY MINIDIGESTERS AND METHOD OF USING THE MINIDIGESTERS

Russell S. Andrews, Jr., Warwick, N.Y., and Emmett V. Moseley, Mobile, Ala., assignors to International Paper Company, New York, N.Y.

Filed Aug. 30, 1978, Ser. No. 938,110

Int. Cl.[2] D21C *7/10, 7/12, 7/14*

U.S. Cl. 162—49 **5 Claims**



1. A laboratory apparatus for generating data regarding the digestion of wood, comprising

(A) a plurality of essentially identical direct-steamed laboratory minidigesters, each digester comprising:

(i) a vessel not greater than 25 liters in volume for containing digestion liquor, said vessel being contained in an insulated enclosure and having a removable top;

(ii) a basket for containing wood inside the vessel;

(iii) electrical heating means for supplying heat externally to the vessel; and

(iv) means for allowing gas and vapor to leave the vessel;

(B) a temperature sensor lying in close proximity to one of the electrical heating means, thereby sensing the temperature of that electrical heating means;

(C) a temperature controller that is connected with the temperature sensor and all of the electrical heating means, wherein the temperature of the electrical heating means is controlled in response to the temperature sensed by the temperature sensor;

(D) a steam manifold for supplying steam internally to each of the vessels so that the steam contacts the digesting liquid; and

(E) means for monitoring and for controlling the steam pressure in the steam manifold, which means thereby control the internal pressures of the vessels.

4. A process for operating a laboratory apparatus useful for generating data on wood digestion, said apparatus comprising (A) a plurality of essentially identical direct-steamed laboratory minidigesters, each minidigester vessel being in an insulated enclosure and of 25 liters or less in volume and having (a) a removable top, (b) a basket for containing wood in the vessel, (c) an external electrical heater for supplying heat externally to the vessel, and (d) a valve for removing gas from the upper portion of the vessel; (B) a temperature sensor lying in close proximity to one of the electrical heating means and producing an output signal; and (C) a steam manifold for supplying steam internally to the vessels; said process comprising:

(a) placing wood and digesting liquid in the vessels;

(b) heating the vessels containing the wood and liquid using the electrical heaters;

(c) sensing the temperature of one of the electrical heaters by means of the temperature sensor lying in close proximity to said electrical heater to facilitate control of the temperatures of all of the electrical heaters;

(d) monitoring and controlling the steam pressure in the steam manifold, thereby controlling the pressure in the vessels;

(e) allowing vapors to leave the vessels through the valves; and

(f) maintaining the temperatures of all of the electrical heaters at the desired operating temperature through use of the output signal from the temperature sensor.

4,193,841

METHOD FOR THE MANUFACTURE OF A MINERAL FIBER SHEET

Gunnar Cederqvist, Lerdala, and Ulf Åberg, Skövde, both of Sweden, assignors to Rockwool Aktiebolaget, Skövde, Sweden

Filed Jun. 7, 1977, Ser. No. 804,287

Int. Cl.[2] D21H 5/18

U.S. Cl. 162—152 **10 Claims**

1. A method for the manufacture of an asbestos-free sheet containing mineral fiber and binder, said sheet being of the type useful as a support felt in flooring, the method comprising the steps of providing an asbestos-free aqueous suspension containing mineral wool fibers and a first portion of binder, forming an asbestos-free layer comprising said aqueous suspension, de-watering said layer to provide an asbestos-free wet sheet containing mineral wool fiber and said first portion of binder, applying a second portion of binder evenly to the entire area of said wet sheet, and thereafter drying the wet sheet to provide a dried, asbestos-free, sheet containing mineral wool fiber and binder, said first portion of binder comprising a dispersion of a resin latex in a liquid medium in which the dispersion is coagulated before it is incorporated into said aqueous suspension, the total amount of said first and second binder portions being from 10 to 40% by weight of said fibers.

4,193,842

METHOD AND APPARATUS FOR CLEANING PAPER MAKING FELT

John C. Rushing, 413 E. Seven Oak Dr., Greenville, S.C. 29607

Filed Aug. 9, 1978, Ser. No. 932,122

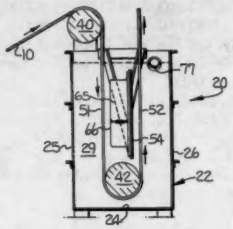
Int. Cl.[2] B08B 3/12

U.S. Cl. 162—199 **20 Claims**

1. A method of uniformly cleaning an endless paper making felt continuously during the paper making process, and comprising the steps of

guiding the moving felt so as to be immersed in a cleaning bath during a portion of the return run of the felt, and

subjecting the moving felt to ultrasonic vibrations while immersed in the bath to thereby dislodge a substantial portion of any fibrous residue or foreign materials on the



felt, and including passing the full width of the felt past a vibrating flat surface and so that the surfaces of the felt are substantially perpendicular to the direction of propagation of the vibrations from the vibrating flat surface, whereby the felt is uniformly cleaned across its full width.

4,193,843

APPARATUS AND METHOD FOR DETECTING DEFECTIVE FUEL RODS

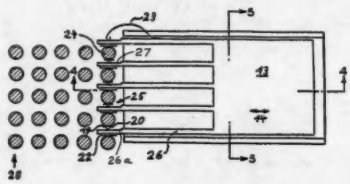
Robert E. Womack; William E. Lawrie, both of Lynchburg, Va., and Alfred Jester, Speyer, Fed. Rep. of Germany, assignors to Babcock-Brown Boveri Reaktor GmbH, Mannheim, Fed. Rep. of Germany

Filed Feb. 2, 1977, Ser. No. 764,797

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1976, 2605962

Int. Cl.[2] G21C 17/00

U.S. Cl. 176—19 LD **8 Claims**



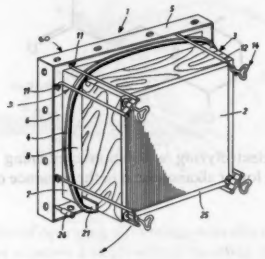
1. Apparatus for the in situ testing of a fuel rod to locate a defective fuel rod in a nuclear fuel assembly of the type having a multiplicity of fuel rods spaced apart by a fixed distance comprising a support plate, a carriage, at least one elongated finger dimensioned to traverse the spaces between the fuel rods extensibly appended from the carriage, the carriage being slideably mounted on the support plate for transversely moving the finger within the spaces between the fuel rods, at least one ultrasonic transducer head fixedly attached to one side of the free end of the finger, spring means mounted on the other side of the finger opposite the ultrasonic transducer head biasing the finger from an adjacent fuel rod for pressing the ultrasonic transducer head against the fuel rod to be tested and means operatively connected to the ultrasonic transducer head for generating an ultrasonic resonance signal in the fuel rod to be tested and for comparing differences in resonance of the fuel rods as an indication of ingressed water.

4,193,844

METHOD OF MOUNTING FILTER ELEMENTS AND MOUNTING THEREFOR

Gerhard M. Neumann, and Jochen Karelin, both of Berlin, Fed. Rep. of Germany, assignors to Delbag-Luftfilter GmbH, Fed. Rep. of Germany

Filed Sep. 20, 1976, Ser. No. 725,006
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1975, 2545309
Int. Cl.[2] G21C 9/00
U.S. Cl. 176—37 13 Claims



1. A device for changing a filter from the clean-air side and for sealing in the contaminants contained in an airborne particle filter in a nuclear installation comprising:

a frame for supporting the filter element;

a sealing groove integral with said frame surrounding said filter element and attached to said frame in a leak-proof manner;

a plastic tube having a diameter surrounding said filter element, said tube having a length substantially greater than the length of said filter element, said tube being sealingly attached at its midsection to the periphery of said filter element;

an elastic ring for sealingly attaching the upstream end of said tube to said sealing groove;

the downstream end of said tube being foldable over said filter element; and

means for detachably securing said filter element to said frame.

4,193,845

IMMOBILIZATION OF ENZYMES OR BACTERIAL CELLS

Isao Kaetsu; Hiroshi Watanabe, both of Takasaki; Tomotaro Sato, Sagamihara, and Akihiko Ito, Takasaki, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Continuation-in-part of Ser. No. 523,162, Nov. 12, 1974, abandoned. This application May 19, 1976, Ser. No. 688,081
Claims priority, application Japan, Nov. 15, 1973, 48-127763
Int. Cl.[2] C07G 7/02; C12K 1/00
U.S. Cl. 435—182 9 Claims

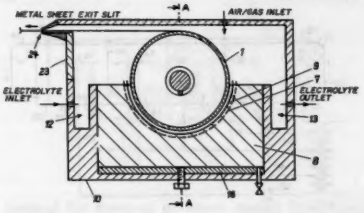
1. A process for producing a porous, water-insoluble polymer composition containing fixed enzyme and/or fixed bacterial cells which comprises mixing an aqueous enzyme solution or an aqueous dispersion of bacterial cells with one or more monomers selected from the group consisting of hydroxyethyl methacrylate, hydroxyethyl acrylate, hydroxypropyl methacrylate and hydroxypropyl acrylate, and then polymerizing and/or copolymerizing the monomer(s) contained in the mixture by means of an ionizing radiation, thereby depositing the polymer containing enzyme and/or cells from water, the irradiation being conducted at a temperature at which the water in the mixture is frozen.

4,193,846

MANUFACTURING PROCESS OF A THIN METAL SHEET BY ELECTROLYTIC DEPOSIT

Fred Barrett, Wirral, England, assignor to Establissment Halgar, Geneva, Switzerland

Filed Aug. 3, 1978, Ser. No. 930,734
Claims priority, application Switzerland, Aug. 3, 1977, 9552/77
Int. Cl.[2] C25D 1/04, 1/20
U.S. Cl. 204—13 8 Claims



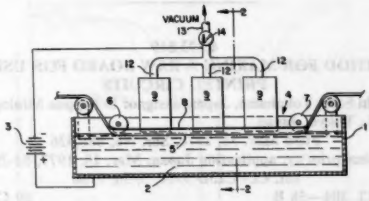
1. Manufacturing process of a thin metal sheet, comprising depositing the metal by electrolysis from a bath containing an aqueous solution of a salt of this metal onto a mobile cathode formed by a rotating drum partially immersed in this bath, removing the metal sheet thus deposited from the non-immersed part of the drum, and replacing in the bath the metal deposited by electrolytic dissolution of an anode containing the same metal, the temperature of the bath being kept higher than its normal boiling point by maintaining on top of the bath a pressure at least equal to the boiling pressure.

4,193,847

METHOD OF ELECTRODEPOSITION

Stanley M. Bloom, Waban; Arnold Hoffman, Brookline, and Kenneth S. Norland, Belmont, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 5, 1978, Ser. No. 939,846
Int. Cl.[2] C25D 5/02, 5/06, 5/56
U.S. Cl. 204—15 9 Claims



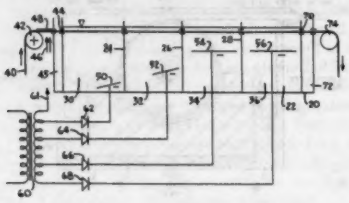
1. A method of electrodepositing a series of spaced patches of electrode active material on a conductive plastic substrate which comprises contacting at least a portion of a first surface of said substrate with an electrolyte from which said material is electrodepositable, establishing a vacuum at a series of spaced predetermined areas of said substrate on a second surface opposite said first surface and in regions spaced from the borders of said substrate and lying within the borders of and opposite said portion, maintaining said predetermined areas of said second surface out of contact with said electrolyte, and causing current to flow through said preselected areas and said electrolyte to deposit said material on said first surface in said preselected areas.

4,193,848

PROCESS FOR THE PRODUCTION OF COMPOSITE MATERIAL

Harald Severus-Laubenteid, Winterthur, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 764,001, Jan. 31, 1977, Pat. No. 4,158,079, which is a continuation of Ser. No. 489,417, Jul. 17, 1974, abandoned. This application Jul. 20, 1978, Ser. No. 926,255
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1973, 2340962
Int. Cl.[2] C25D *11/24*
U.S. Cl. 204—28 11 Claims



1. A process for the production of composite material which comprises:

(a) providing a layer of flexible plastic material;

(b) providing a layer of aluminum or aluminum alloy foil material adhesively bonded to said flexible plastic, with an aluminum oxide layer produced by anodizing having a thickness of at least 3 microns on the exposed surface of said foil;

(c) coloring and sealing the oxide layer;

(d) coating the oxide layer with a layer of light sensitive plastic material which is a photoresist layer having the property of being hardened by ultra-violet light, placing a film negative on said photoresist layer wherein ultra-violet light hardens the illuminated portion of the photoresist layer; and

(e) exposing said composite to ultra-violet light through said negative, removing the unhardened portions of the photoresist layer, etching away the aluminum oxide and aluminum layers under those portions of the photoresist layer which are not hardened and removing the adhesive layer thereunder to expose said flexible plastic material, and removing the photoresist layer.

4,193,849

METHOD FOR MAKING A RAW BOARD FOR USE IN PRINTED CIRCUITS

Junichi Sato, Yokohama, Japan, assignor to Nippon Mining Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1978, Ser. No. 886,826
Claims priority, application Japan, Mar. 18, 1977, 52-29241
Int. Cl.[2] C25D *5/02, 5/56, 7/06*
U.S. Cl. 204—38 B 10 Claims

1. A method for making a raw board for use in printed circuits, comprising the steps of subjecting a very long film of a flexible plastic which can be easily rolled into a roll form to vapor deposition with a metal so as to vapor-deposit the metal directly onto the surface of the flexible film, and continuously immersing the flexible film in an electrochemical bath including as an additive a brightener which has its brightening effect only at a temperature between about 15° to 30° C., said bath being kept at a temperature between 50°–60° C. where said brightener has no brightening effect so that a metal is continuously electroplated on the surface of the metal previously vapor-deposited on the surface of the flexible film thereby to produce a flexible raw board for use in printed circuits with the raw board having approximately 1.5 kg/cm of peel strength.

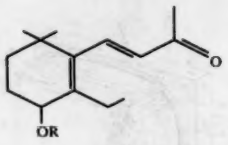
4,193,850

ALKANOYLOXYLATION OF BETA-IONONE

Urs Hengartner, Roseland; Gilbert Reymond, Clinton, and Valdemar Toome, Nutley, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 12, 1979, Ser. No. 29,170
Int. Cl.[2] C25B *3/02*; C07C *35/08*
U.S. Cl. 204—79 7 Claims

1. A process for producing alkanoyloxy beta-ionone of the formula:



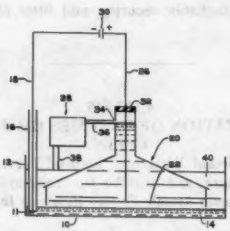
comprising electrolyzing a solution containing beta-ionone dissolved in a lower alkanoic acid in the presence of an electrolyte.

4,193,851

SILICA GELS AND THEIR FORMATION BY ELECTROLYSIS OF SILICATE SOLUTIONS

Roger A. Crawford, Wadsworth, and Howard H. Hoekje, Corpus Christi, both of Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 21, 1978, Ser. No. 927,269
Int. Cl.[2] C25B *1/00*
U.S. Cl. 204—101 5 Claims



1. A process for producing silica gel upon an anode from a silicate solution containing hydroxyl ions which comprises:

neutralizing the hydroxyl ions by electrolysis at conditions which maintain the concentration of hydroxyl ions within the range whereby silicate ions polymerize to form a silica gel by placing the silicate solution containing hydroxyl ions within an electrolytic cell in the vicinity of an anode adapted to neutralize hydroxyl ions and to collect silica gel thereon, removing the hydroxyl ions from the solution in the effective vicinity of the anode at a rate whereby the hydroxyl ion concentration within the effective vicinity of the anode is maintained at the range whereby silica ions polymerize to form a silica gel which collects upon the anode, and

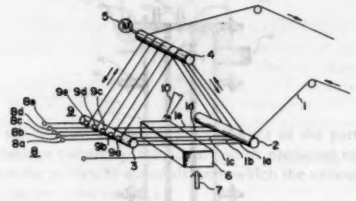
collecting the silica gel.

4,193,852

METHOD AND APPARATUS FOR ELECTRICAL MACHINING WITH A MULTI-GUIDED TRAVELLING ELECTRODE

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jun. 13, 1978, Ser. No. 915,206
Claims priority, application Japan, Jun. 14, 1977, 52-70248; Jul. 18, 1977, 52-85889; Dec. 21, 1977, 52-154959
Int. Cl.[2] B23P *1/10, 1/12, 1/16, 1/00*
U.S. Cl. 204—129.46 30 Claims



1. A method of operating a traveling-wire electrical machining apparatus wherein a single-strand traveling wire is guided in a plurality of passes in juxtaposition with a workpiece, said method comprising the steps of:

relatively displacing said workpiece and said wire so that respective stretches of the wire cut through said workpiece at respective locations;

applying a machining liquid to said locations; and

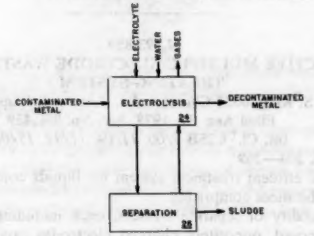
applying across the workpiece and each of said stretches individually a machining current from a common power supply, thereby equalizing the current distribution to said stretches of said wire.

4,193,853

DECONTAMINATING METAL SURFACES

Everett L. Childs, Boulder, and Jack L. Long, Arvada, both of Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 15, 1979, Ser. No. 39,428
Int. Cl.[2] C25F *3/02*
U.S. Cl. 204—129.95 8 Claims



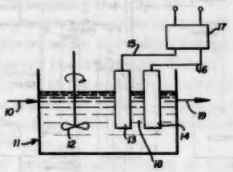
1. A process for decontaminating an object having a surface contaminated with a radioactive substance comprising: contacting said object with a basic aqueous solution containing nitrate, fluoride, borate, and oxalate anions; thereafter electrolytically removing a surface layer of said object; and subsequently separating resulting precipitate from said solution.

4,193,854

HEAVY METAL REMOVAL FROM WASTEWATER SLUDGE

Raymond F. Drnevich, Clarence Center; Ladislas C. Matsch, Amherst, and Embar G. Srinath, Tonawanda, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 863,924, Dec. 23, 1977, abandoned. This application Nov. 21, 1978, Ser. No. 961,253
Int. Cl.[2] C02C *5/12*
U.S. Cl. 204—149 11 Claims



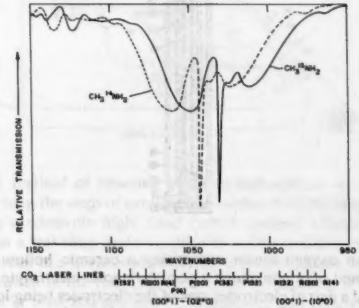
1. A method for removal of heavy metals from activated sewage sludge comprising: aerating the activated sewage sludge with oxygen-containing gas as the sole source of oxygen to biochemically oxidize the heavy metal sulfides to the soluble sulfate form; establishing and maintaining a voltage difference between a cathode and an anode in the soluble heavy metal sulfate-containing sludge as an electrolytic bath; maintaining said bath in an acidic and an aerobic condition and depositing heavy metals at the cathode; and separating aerated and heavy metal-depleted sludge from said electrolytic bath.

4,193,855

ISOTOPE SEPARATION BY MULTIPHOTON DISSOCIATION OF METHYLAMINE WITH AN INFRARED LASER

Sam A. Tuccio, Randolph, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Mar. 31, 1978, Ser. No. 892,228
Int. Cl.[2] B01D *54/00*; B01J *1/10*
U.S. Cl. 204—158 R 6 Claims



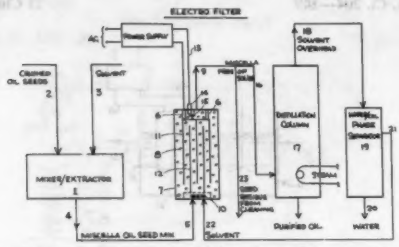
1. A process for obtaining compounds which are enriched in a particular first elemental isotope which comprises exposing gaseous methylamine containing said first isotope and one or more other isotopes of the same element to infrared radiation of a predetermined wave length from a laser which selectively dissociates said methylamine containing said first isotope without substantially dissociating said methylamine containing other isotopes of said element.

4,193,856

USE OF ELECTROFILTER AS AN EXTRACTION COLUMN

Leslie R. Watkins, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Jun. 24, 1977, Ser. No. 809,745
Int. Cl.[2] B03C 5/00
U.S. Cl. 204—186 **19 Claims**



15. The process which comprises in sequence:
(a) loading the bed of an electrically activated electrofilter with oilseeds from a miscella-oilseed mixture, said oilseeds having adhering miscella,
(b) flushing the loaded bed with a dielectric solvent for the oil so as to remove the miscella and additional oil from the oilseed solids,
(c) electrically deactivating the electrofilter bed, and
(d) removing deoiled solids from the electrofilter bed by flushing with a dielectric fluid.

4,193,857

OXYGEN SENSORS

Michael J. Bannister, Glen Waverley; Neil A. McKinnon, North Balwyn, and Robert R. Hughan, Glen Iris, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Dec. 7, 1977, Ser. No. 858,328
Claims priority, application Australia, Dec. 7, 1976, PC8395; Aug. 18, 1977, PD1302
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—195 S **20 Claims**

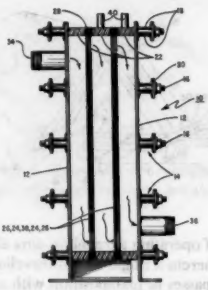
1. An oxygen sensor comprising a ceramic hollow body composed of or containing a composite solid electrolyte material and a pair of electrodes, one of the electrodes being located within said hollow body and the other being located outside said hollow body, said electrodes being separated by said composite solid electrolyte material, and said composite solid electrolyte material comprising a mixture of at least one non-electrolyte constituent or phase which is selected from the group consisting of alumina, aluminous porcelain and mullite, and at least one constituent or phase which is a good oxygen ion conductor, the microstructure of the composite material consisting of an intimate mixture of fine grains of the oxygen ion conducting and the non-electrolyte constituents, the oxygen ion constituent grains of which comprise from 25 to 75 percent by volume of the mixture.

4,193,858

STACK PACK ELECTROLYTIC CELL

J. Edward Loeffler, Jr., Kirtland, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed Nov. 3, 1978, Ser. No. 957,324
Int. Cl.[2] C25B 9/04, 11/03, 11/00
U.S. Cl. 204—268 **9 Claims**



1. A stack pack electrolytic cell for the production of chlorates or hypochlorites comprising: two end plates; each of said end plates having a plurality of structural cross members overhanging each edge of said end plates for tying and compressing internal units therebetween in liquid tight configuration; tie rods for extending and connecting the overextending edges of said structural cross members in order to compress the components between said end plates; two or more chamber sections in sealing engagement between said end plates; at least one electrode stack pack; said electrode stack pack containing one outside cathode, a foraminous anode, then a central cathode, a foraminous anode and finally a second outside cathode with the anodes having electrocatalytically active coatings thereon; said cathodes made of metallic sheet having apertures therein so as to provide electrolyte flow throughout said electrode stack pack; said cathodes acting as separators between said electrode packs to insure proper flow for cleaning the electrolytic cell of deposits; at least one access port for the removal of hydrogen gas from the electrolytic cell; means for supplying electrolyte feed to the interior of the electrolytic cell; means for removing the production of chlorates or hypochlorites from the electrolytic cell; and means for providing a direct electrical current between said anodes and said cathodes for the production of chlorates or hypochlorites.

4,193,859

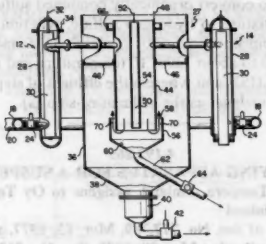
SELECTIVE MULTIPLE ELECTRODE WASTE WATER TREATING SYSTEM

Arthur S. King, 8021 Cherokee La., Leawood, Kans. 66206

Filed Aug. 31, 1978, Ser. No. 938,439
Int. Cl.[2] C25B 9/00, 11/04, 11/12, 15/08
U.S. Cl. 204—269 **8 Claims**

1. An effluent treatment system for liquids containing foreign substances comprising:
a plurality of separate treaters, each including a pair of opposed, oppositely charged electrodes exposed to the liquid as it passes through the treater,
each treater having at least one of its electrodes constructed from a different material than either of the electrodes of other treaters of the plurality of treaters;
a liquid supply manifold common to all of said plurality of treaters;
a receiver common to all of said treaters for reception of liquid therefrom after treatment; and

control means operable to open and close liquid flow communication between said manifold and each individual treater to permit treatment of the liquid by a selected one



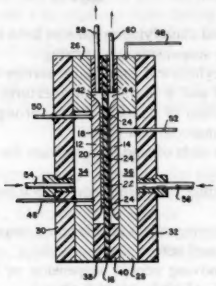
of the treaters according to the nature of the particular substance carried by the liquid and its predicted reaction with the particular materials from which the various electrodes are constructed.

4,193,860

LIQUID-PERMEABLE ELECTRODE

George R. Folser, Lower Burrell, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 30, 1978, Ser. No. 938,141
Int. Cl.[2] C25B *1/02, 11/12;* C04B *35/52*
U.S. Cl. 204—284 5 Claims



1. Method of preparing a rigid, porous, liquid-permeable low-electrical-resistance electrode for use in an electrolytic cell comprising:

mixing about 10 parts by weight of activated charcoal, from 6 to 10 parts by weight of a powdered thermosetting resin selected from the group consisting of phenol formaldehyde and phenol furfuryl and 3 to 5 weight percent, relative to the activated charcoal, oxalic acid to form a mixture;

compacting the mixture in a heated mold to melt the resin, forming a green electrode; and

heating the green electrode to from 550° to 750° C. in a nonoxidizing atmosphere for a period of time sufficient to pyrolyze the resin, volatilize the oxalic acid and volatilize from about 40 to 60 percent of the resin in the green electrode, thereby forming a rigid, porous, liquid-permeable electrode having a low electrical resistance.

4,193,861

PROCESS FOR INSTALLING SYNTHETIC FIBER DIAPHRAGMS IN CHLOR-ALKALI CELL

David A. Kramer, Dearborn; Shyam D. Argade, Farmington Hills, both of Mich., and Edward N. Balko, Wilmington, Mass., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 8, 1979, Ser. No. 1,445
Int. Cl.[2] C25B *13/08*
U.S. Cl. 204—296 23 Claims

23. A process for installing a synthetic fiber diaphragm in a chlor-alkali cell, comprising the steps of

placing the diaphragm in position in the cell,

adding an aqueous saline electrolyte solutin to the cell to about the desired operating level therein,

adding a surfactant to the electrolyte solution in an amount sufficient to reduce the surface tension of the electrolyte solution below the critical surface tension for wetting the fibrous diaphragm,

subjecting the immersed diaphragm to a subatmospheric pressure of the order of the vapor pressure of the solution to about 200 millimeters mercury absolute for from about five minutes to one hour, and

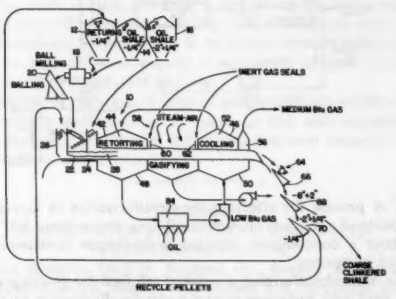
returning the pressure to atmospheric pressure or cell working pressure while retaining the diaphragm in working position in the electrolyte.

4,193,862

RECOVERY OF OIL AND GAS FROM OIL SHALE

Thomas E. Ban, South Euclid, and William H. Marlowe, Euclid, both of Ohio, assignors to McDowell-Wellman Company, Cleveland, Ohio

Filed Jun. 26, 1978, Ser. No. 919,081
Int. Cl.[2] C10G *1/02*
U.S. Cl. 208—11 R 16 Claims



1. A method of educting oil from high-carbon oil shales, comprising the steps of providing a burden of oil-bearing shale having a relatively high, fixed carbon content, charging the shale in a traveling grate machine to form a burden, moving the burden in a horizontal plane into a retorting zone, heating said burden in the retorting zone to an oil-educting temperature of at least 800 degrees F., condensing and removing oil educted from the burden, moving the burden to a gasifying zone, heating said burden in the gasifying zone in the presence of an oxygen-containing gas also containing between about 5% to about 15% water to raise the burden to a temperature which will convert substantial amounts of residual carbon in the burden to carbonaceous gases and which will promote substantial agglomeration or clinkering of the spent shale to enable a separation-recycling process, cooling the spent shale, and discharging coarse clinkered shale from the machine.

4,193,863

HYDROCARBON CONVERSION WITH AN ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 833,332, Sep. 14, 1977. This application Oct. 2, 1978, Ser. No. 947,906

The portion of the term of this patent subsequent to Feb. 14, 1996, has been disclaimed.

Int. Cl.[2] C10G *35/08*

U.S. Cl. 208—139 **21 Claims**

1. A process for converting a hydrocarbon which comprises contacting at hydrocarbon conversion conditions said hydrocarbon with a catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state, and of a cadmium component.

19. The process of claim 1 wherein said hydrocarbon is a gasoline fraction which is contacted with said composite in the presence of hydrogen and said hydrocarbon conversion conditions to include reforming conditions.

4,193,864

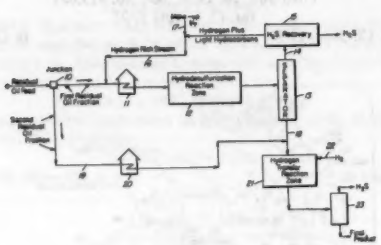
RESIDUAL OIL DESULFURIZATION IN MULTIPLE ZONES WITHOUT CONCOMMITANT INCREASE IN HYDROGEN CONSUMPTION

Clarence D. Chang, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 769,640, Feb. 17, 1977, abandoned. This application Jun. 2, 1978, Ser. No. 912,126

Int. Cl.[2] C10G *23/02*

U.S. Cl. 208—210 **6 Claims**



1. A process for effecting the desulfurization of increased amounts of a residual oil, which oil boils above about 650° F., without a concomitant increase in hydrogen consumption, which comprises:

(a) hydrodesulfurizing a residual oil feed by reacting said feed with hydrogen over a hydrodesulfurization catalyst in a first reaction zone at hydrodesulfurization conditions of from about 500 to about 3000 psig pressure, about 600 to about 1000° F. temperature, about 0.2 to about 5 LHSV and about 1,000 to about 20,000 SCF/bbl. hydrogen rate, whereby a portion of the aromatics contained in said feed are converted to naphthenes and a portion of the organically combined sulfur contained in said feed is converted to hydrogen sulfide, thereby obtaining a liquid effluent having a lower sulfur content and a higher naphthene content than said residual oil feed; and

(b) desulfurizing an additional amount of said residual oil by combining said additional amount with the effluent of step (a) in an amount of from about 0.5 to about 4 bbl. of effluent of step (a) per bbl. of additional residue oil feed and reacting the resultant mixture in a second reaction zone over a catalyst comprising at least one metallic component selected from Groups VIB and VIII of the Periodic Table deposited on an acidic support selected from the group consisting of refractory inorganic oxides, crystalline aluminosilicate zeolites and combinations thereof, at conditions such that naphthenes contained in the mixture are dehydrogenated and the hydrogen so released is utilized to convert organically combined sulfur contained in said mixture to hydrogen sulfide, wherein said conditions comprise about 500 to about 3,000 psig pressure, about 700 to about 1200° F. temperature and about 0.2 to about 5 LHSV and wherein the effluent of step (b) has the same sulfur level as the effluent of step (a).

4,193,865

CLASSIFYING APPARATUS FOR A SUSPENSION

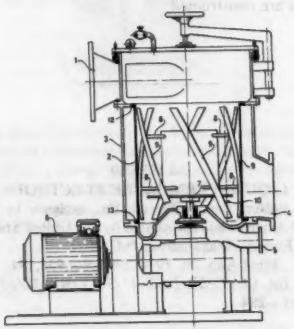
Matti Aario, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

Continuation of Ser. No. 777,789, Mar. 15, 1977, abandoned. This application May 30, 1978, Ser. No. 910,434

Claims priority, application Finland, Mar. 16, 1976, 760686

Int. Cl.[2] B07B *1/20*

U.S. Cl. 209—240 **3 Claims**



1. An improved classifying apparatus for a suspension, especially for a pulp suspension, comprising

a generally cylindrical stationary screen drum having a central axis and a plurality of apertures formed therein along a portion of its axial extent through which accept suspension material can pass;

means at both ends of said screen drum for supporting said drum;

means for feeding the suspension to one side of the screen drum;

means for removing reject or thickened suspension from said one side of said screen drum;

means for removing accept suspension or liquid from the opposite side of said screen drum;

sweeping means for generating hydraulic impulses to detach solids attached to said drum;

said sweeping means comprising a plurality of inclined blades;

blade support means for supporting said inclined blades for rotation in a predetermined direction about the central axis of said drum so that said blades are inclined relative to said axis and to their direction of rotation and so that said blades sweep a surface of the screen drum; and

driving means connected to said blade support means to establish motion of said blades relative to said surface, said blade support means being arranged to establish the angle of inclination of said blades so that the end portion of each of said blades near one end of said drum overlaps an end portion of at least one other of said blades near the other end of said drum with respect to an axial line along said drum, said overlap being sufficient to dampen said hydraulic impulses and lying axially within said portion of

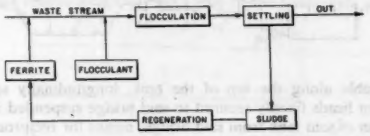
said drum in which said apertures are formed to permit the accept suspension material to pass therethrough.

4,193,866

FERRITE FLOCCULATING SYSTEM

George M. J. Slusarczuk, Schenectady, and Ronald E. Brooks, Guilderland, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 27, 1976, Ser. No. 726,961
Int. Cl.[2] C02B *1/20*; C02C *5/02*
U.S. Cl. 210—6 **6 Claims**



1. A method for purifying an aqueous polluted liquid containing particulate suspended impurities by removing at least 60% of said particulate suspended impurities therefrom, which comprises suspending and distributing a magnetic ferrite powder in said polluted liquid substantially uniformly in an amount ranging from about 500 parts to about 1000 parts per million parts of said polluted liquid, said magnetic ferite powder being a magnetic oxide containing iron as a major component and having the general formula Fe_2O_3-Metal O, said magnetic ferrite powder being suspendible in said polluted liquid and ranging in diameter from about 200 Angstroms to about 100 microns, after said magnetic ferrite powder has been distributed and suspended within said polluted liquid adding to said polluted liquid an aqueous flocculating solution in an amount which co-flocculates said suspended particulate impurities and said suspended magnetic ferrite powder forming a dense flocculated mixture which settles forming a sludge, and separating said sludge, said aqueous flocculating solution consisting essentially of about 0.01 part to 1 part of polyethyleneimine per 100 parts of water, and said aqueous flocculating solution being used in an amount ranging from about 0.5 part to about 10 parts per million parts of said polluted liquid.

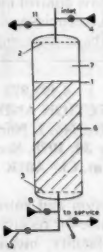
5. A method according to claim 1 wherein said separated sludge is biologically treated causing removal of impurities and bioregeneration of the magnetic ferrite powder.

4,193,867

OPERATION OF A TWO-PHASE REACTOR

Sheldon Evans, Overveen, Netherlands, assignor to Hoogovens IJmuiden, B.V., IJmuiden, Netherlands

Filed Oct. 3, 1975, Ser. No. 619,245
Claims priority, application United Kingdom, Oct. 3, 1974, 43015/74
Int. Cl.[2] B01D *15/06*
U.S. Cl. 210—20 **11 Claims**



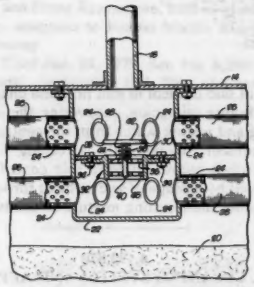
1. A regenerative base ion exchange process involving the step of passing a liquid upwardly through a bed of particulate solid base ion exchange resin in a chamber of a two-phase reactor to regenerate said resin, wherein the rate of liquid flow is such that the solid resin is compacted and held by the liquid as a compact bed against a barrier located above it and is prevented by the liquid from sinking.

4,193,868

ION EXCHANGE METHOD AND APPARATUS

Peter S. Meyers, Covina, Calif., assignor to Chromalloy American Corporation, City of Industry, Calif.

Filed May 30, 1978, Ser. No. 910,675
Int. Cl.[2] B01D *15/06*
U.S. Cl. 210—35 **8 Claims**



8. A process of operating an ion exchange apparatus including a container having a top and bottom, ends, conduits leading into the ends of said container, a plurality of channel means located at the top of said container, all of said channel means being connected to said conduit at the top of said container, check valve means being located so as to be capable of preventing flow from the conduit at the top of the container into at least some of said channels, a bed of ion exchange resin within the interior of said container which comprises steps of:

alternatively passing water to be treated upwardly through the bed and then passing a regenerant solution downwardly through said bed, and

utilizing the downward flow of said regenerant solution to actuate said check valve means so that said regenerant solution is distributed within said container through less than all of said channels.

4,193,869

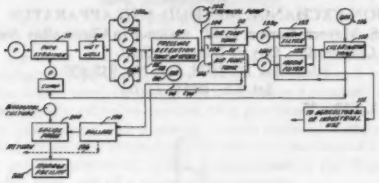
WASTEWATER AND WASTEWATER SOLID PROCESSING SYSTEM

Milton Brucker, 1010 N. Rexford Dr., Beverly Hills, Calif. 90210; Ronald J. Matika, 4395 Jutland Ave., San Diego, Calif. 92117, and Maurice E. McMican, 7970 Mission Gorge Rd., Santee, Calif. 92071

Continuation-in-part of Ser. No. 525,753, Nov. 21, 1974, abandoned, and Ser. No. 669,914, Mar. 24, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,061
Int. Cl.[2] B03D *1/00, 1/24*
U.S. Cl. 210—44 **26 Claims**

12. A process for treating wastewaters containing solids and dissolved organic matter, which comprises passing wastewater influent through a screen for removal of solids, incorporating a floculating agent into said last-mentioned influent to floculate any fine solid particles remaining in said influent, passing air under pressure into the resulting influent, introducing said influent containing dissolved air under pressure and floculated solids into the lower portion of a flotation chamber at about atmospheric pressure, the reduction in pressure of said influent causing the air bubbles released from said influent to float the floculated suspended solids to the surface of said influent in

said flotation chamber, removing said floculated solids as a scum from the surface of said influent, withdrawing the resulting substantially clear influent from the flotation chamber, treating said last-mentioned influent with chlorine or ozone in a sterilizer tank, to destroy bacteria in said influent, filtering the sterilized influent for removal of any remaining undissolved solids, collecting said scum of floculated solids removed from



the surface of said influent in said flotation chamber, in a scum tank, centrifuging said scum, recovering the solids from said centrifuging and mixing water from the centrifuging with the incoming influent following the screening of said influent, mixing the solids recovered from said centrifuging with the solids removed by passage of said influent through said screen, and incinerating the resulting mixture of solids.

4,193,870

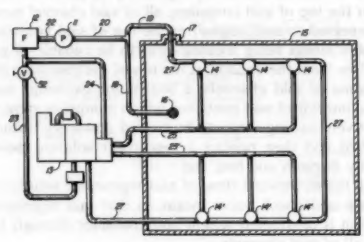
POOL CLEANING SYSTEM AND APPARATUS

Raymon L. Goodin, 2227 W. Overton, Tucson, Ariz. 85704

Filed Nov. 15, 1978, Ser. No. 960,827

Int. Cl.[2] B01D *37/00*

U.S. Cl. 210—65 **8 Claims**



6. A method for circulating and cleaning water in a swimming pool comprising the steps of:

pumping water out of a drain of the swimming pool,

filtering said water and subsequently pumping a first part of said water back into the swimming pool through rotatable jet nozzle means producing jet streams,

periodically introducing air into a second part of the water pumped back into said swimming pool to periodically increase its flow rate, and

rotating said jet nozzle means by said second part of the water during the period of its increased flow rate.

4,193,871

CLARIFIER

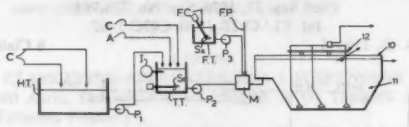
Harold R. White, New Lenox, and Alexander J. Doncer, Jr., Palos Heights, both of Ill., assignors to Alar Engineering Corporation, Chicago, Ill.

Filed Feb. 26, 1979, Ser. No. 15,463

Int. Cl.[2] B01D *21/00*

U.S. Cl. 210—142 **22 Claims**

1. A travelling bridge clarifier comprising an elongated rectangular tank having a converging hopper bottom with a narrow sediment collecting zone along the length of the tank, an inlet compartment at one end of said tank and an outlet at the other end of the tank, vertical flow straighteners between said compartment and said tank, a vertical baffle behind said flow straighteners directing liquid to be clarified over the top thereof to the flow straighteners, outlet weirs projecting longitudinally in the top of the tank from the outlet end thereof and receiving clarified liquid along the lengths thereof, a bridge



moveable along the top of the tank, longitudinally spaced suction heads fixedly secured to said bridge suspended in the bottom of said tank from said bridge, means for reciprocating said bridge along said tank in a predetermined stroke to maintain said suction heads within localized portions in the bottom of said tank, and means for selectively independently evacuating said suction heads to remove sludge from said localized portions of the narrow sediment collecting zone of the tank.

4,193,872

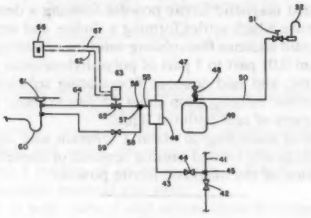
FLUSHING SYSTEM FOR REVERSE OSMOSIS WATER PURIFICATION UNITS

Wayne A. Parkinson, 800 E. St. Louis Ave., Las Vegas, Nev. 89105

Filed Aug. 9, 1978, Ser. No. 932,289

Int. Cl.[2] B01D *41/00*

U.S. Cl. 210—143 **6 Claims**



1. In a water delivery system for a sink having a cold water faucet, a separate purified water faucet, and a drain, a water source, a reverse osmosis water purification cartridge having a feed water inlet connected to the water source upstream of the cold water faucet, a purified water outlet, and a contaminated water outlet, the improvement therein which comprises a flow control means for automatically periodically increasing flow from the water source through the feed water inlet for short periods of time, said flow control means comprising either the cold water faucet or a solenoid-operated valve actuated by an on/off switch to a garbage-disposing apparatus.

4,193,873

MANURE COLLECTION AND STORAGE SYSTEM

Donald D. Thrasher, Rte. No. 1, North Manchester, Ind. 46962

Filed May 30, 1978, Ser. No. 910,693

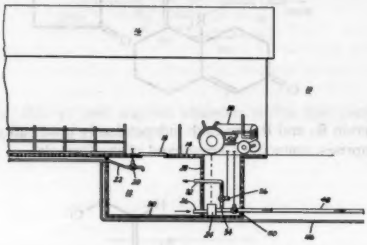
Int. Cl.[2] A01K *1/00*

U.S. Cl. 210—170 **11 Claims**

1. A manure collection and storage system comprising: a first collecting receptacle for receiving manure collected from an animal confining facility; means for selectively feeding water to said first receptacle thereby to form a slurry of the manure therein; a first pump having an intake coupled to said first receptacle for withdrawing slurry therefrom and having a

discharge; a second storage receptacle remote from said first receptacle; first means for selectively coupling said first pump discharge to said second receptacle thereby to transfer slurry thereto from said first receptacle; a second pump having an intake and a discharge, second means for coupling said second receptacle to said second pump intake for withdrawing slurry therefrom; third means for selectively coupling said second pump discharge to said second receptacle thereby to return slurry thereto to agitate the slurry therein; and fourth means for selectively coupling said second pump discharge to a discharge line thereby to remove slurry from said second receptacle;

said second receptacle has a bottom and a side wall, said first



means being coupled to said second receptacle through said bottom, said third means being coupled to said second receptacle through said side wall at least at a first level adjacent said bottom, said second means being coupled through said side wall at least at said second level spaced above said first level;

said second and third means are coupled to said second receptacle through said side wall at horizontally displaced points in the respective second and first levels;

said third means is also coupled to said second receptacle through said side wall at least at one other level above said first level, and said second means is also coupled to said second receptacle through said side wall at least at one other level above said second level.

4,193,874

FILTER CENTRIFUGE

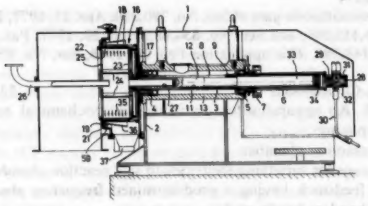
Hans Gerteis, Bietigheim-Bissingen, Fed. Rep. of Germany, assignor to Firma Heinkel Industriezentrifugen GmbH & Co., Fed. Rep. of Germany

Filed Mar. 6, 1978, Ser. No. 883,721

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 2710624

Int. Cl.² B01D *33/10*

U.S. Cl. 210—232 **17 Claims**



1. Filter centrifuge for the separation of solid and liquid components found in a suspension, with a centrifugal drum open at one front side, with radial discharge openings, positioned rotatably in a centrifuge housing, and with a filter cloth insertable in the drum, which is removably fastened on the one side to the opening edge of the drum which is tightly sealed by a centrifuge bowl cover, and on the other side to a base plate rigidly joined with the cover in such a way as to leave an open space between them, wherein the centrifugal drum and the base plate are arranged coaxially with one another, and can be set into rotation together, and are movable axially with respect to one another, characterized in that a supporting screen (**41**) is provided between the centrifugal drum (**16**) and the filter cloth (**22**), said supporting screen comprising support elements which are both in direct contact with said filter cloth and oriented exclusively parallel to the center axis of said centrifugal drum and to the axial direction of stripping of the filter cloth.

4,193,875

ROTARY FILTER

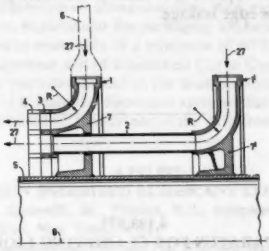
Werner Stahl, and Franz Krappmann, both of Munich, Fed. Rep. of Germany, assignors to Krauss Maffei AG, Munich, Fed. Rep. of Germany

Filed Jan. 24, 1979, Ser. No. 6,290

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1978, 2804779

Int. Cl.² B01D *33/26*

U.S. Cl. 210—330 **23 Claims**



1. A rotary disk filter comprising a filter shaft, a plurality of filter disks mounted on said shaft in axially spaced relation and rotatable into a trough containing a suspension to be filtered and out of said trough to dry a filter cake upon the respective disk, each of said disks having a plurality of sectors forming respective filter cells and a cell carrier provided with filtrate passages respectively communicating with said cells, and a control head surrounding said shaft and communicating successively between the passages of each disk and an external conduit, one of said disks being relatively proximal to said control head and another of said disks being relatively distal from said control head, each of said passages having a bend connecting a radial portion with an axial portion, the axial portions of said passages of said distal carrier being formed by respective straight tube sections disposed externally of the filter shaft.

4,193,876

MEANS FOR SUPPRESSING EDGE LEAKAGE IN FILTER PRESSES

Gordon Leeke, Glastonbury, and Joseph W. Helme, Ellington, both of Conn., assignors to AMF Incorporated, White Plains, N.Y.

Filed Sep. 27, 1978, Ser. No. 946,268

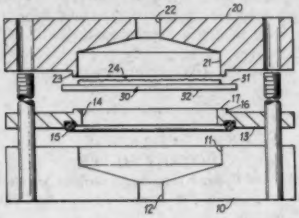
Int. Cl.² B01D *25/12*

U.S. Cl. 210—489 **2 Claims**

1. A liquid filter for disposition between adjacent plates of a filter press and having axially aligned central flow path openings and opposed seal faces encircling said openings, comprising

a disc of predetermined size and shape of a sheet of filter media including fibrous cellulose and non-compressible mineral particulate material of predetermined concentration and particle size;

means for substantially eliminating edge learage due to wicking when said filter is disposed between said plates, said means, consisting of a flange portion extending outwardly from the flow path openings when retained between plates of a filter press, and



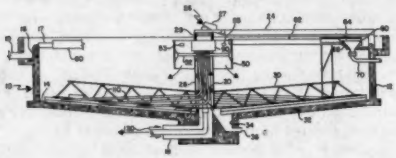
said flange being dry pressed prior to use, to a density corresponding to a thickness approximately one half of its original thickness, said flange having sufficiently smooth surfaces to be engaged by and forming sealing interfaces with the opposed seal faces of the filter press plates to suppress edge leakage.

4,193,877

APPARATUS FOR CLARIFYING LIQUID

Mitchell J. Lillywhite, Draper, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Apr. 7, 1978, Ser. No. 894,298
Int. Cl.[2] B01D *21/24*
U.S. Cl. 210—520 **9 Claims**



1. An apparatus for clarifying liquid waste comprising:

a. a tank to contain the waste so that the surface of the waste is at a predetermined level;

b. a center column mounted vertically on the floor of said tank;

c. means for collecting sludge from the floor of said tank and removing the collected sludge from said tank, said sludge collecting means including at least one sludge box affixed to the upper part of said center column;

d. influent means connected to said center column for introducing the waste into said tank to be clarified, said influent means including at least one port formed in the center column at about the predetermined level of the waste in said tank to introduce waste into said tank so that the surface of the waste flowing from said at least one port is at substantially the same elevation as the predetermined level of the waste in said tank;

e. means for removing clarified waste from said tank; and,

f. means for removing scum from said tank.

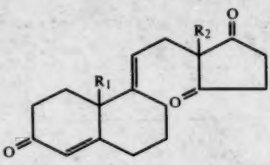
4,193,878

14β-HYDROXYANDROSTANES

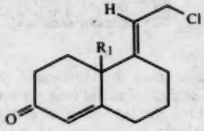
Zdenek Valenta, Fredericton, Canada, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 811,393, Jun. 29, 1977, Pat. No. 4,134,920.
This application Oct. 12, 1978, Ser. No. 950,915
Int. Cl.[2] C07C *49/48, 49/46*
U.S. Cl. 260—586 C **4 Claims**

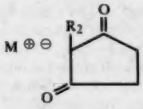
1. A process for the preparation of a compound of the formula



wherein R_1 and R_2 are each independently lower alkyl which comprises contacing a compound of the formula



wherein R_1 is lower alkyl with a compound of the formula



wherein R_2 is lower alkyl and M is an alkali metal in the presence of an alkali metal iodide, the reaction being conducted in a medium comprising a polar aprotic solvent and a lower alkanol at room temperature.

4,193,879

APPARATUS FOR POWERFUL ENERGY TRANSFER TECHNIQUE

Sam L. Leach, P.O. Box 2436, Palos Verdes Peninsula, Calif. 90274

Continuation-in-part of Ser. No. 790,320, Apr. 25, 1977, Pat. No. 4,113,589, and Ser. No. 834,682, Sep. 19, 1977, Pat. No. 4,148,701. This application Feb. 21, 1978, Ser. No. 879,226
Int. Cl.[2] B01J *1/00*
U.S. Cl. 250—527 **52 Claims**

15. An apparatus for controlled photochemical reactions comprising:

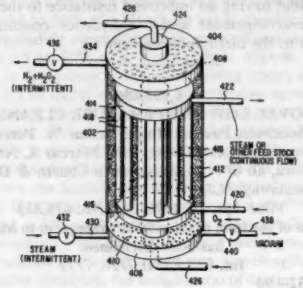
a reaction chamber;

means for supplying feedstock to said reaction chamber, said feedstock having a predetermined frequency absorption band or bands; and

means for flooding said reaction chamber with radiation within at least one of the absorption bands of said feedstock;

said means including at least one gas discharge tube having output radiation of a lower frequency than said predetermined band or bands and means in physical proximity to said gas discharge tube and also exposed to said reaction

chamber for receiving said lower frequency radiation from said gas discharge tube and for supplying intense



radiation to said reaction chamber within said predetermined band or bands.

4,193,880

APPLICATION OF FLUOROCARBON COMPOUND TO SYNTHETIC ORGANIC POLYMER YARN

Robert M. Marshall, Chester, Va., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 1,625, Jan. 8, 1979. This application Mar. 30, 1979, Ser. No. 25,636

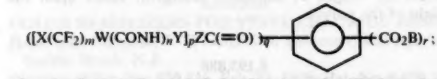
Int. Cl.[2] D06M *13/34*

U.S. Cl. 252—8.8 **16 Claims**

1. A yarn finish composition comprising:

a. about 15 to 80 weight percent of a nonhomogeneous mixture of a salt of dinonyl sulfosuccinate, a salt dimethyl naphthalene sulfonate, and ammonium perfluoralkyl carboxylate, and

b. about 20 to 85 weight percent of a fluorochemical compound having the formula



wherein the attachment of the fluorinated radicals and the radicals CO_2B to the nucleus is in asymmetrical positions with respect to rotation about the axis through the center of the nucleus; wherein "X" is fluorine, or perfluoroalkoxy of 1 to 6 carbon atoms, and m has arithmetic mean between 2 and 20; n is zero or unity; "W" and "Y" are alkylene, cycloalkylene or alkyleneoxy radicals of combined chain length from 2 to 20 atoms; $(CF_2)_m$ and "Y" have each at least 2 carbon atoms in the main chain; "Z" is oxygen and p is 1 or "Z"O is nitrogen and p is 2; q is an integer of at least 2 but not greater than 5; "B" is CH_2RCHOH or is $CH_2RCHOCH_2RCHOH$ where "R" is hydrogen or methyl, or "B" is $CH_2CH(OH)CH_2Q$ where Q is halogen, hydroxy, or nitrile; or "B" is $CH_2CH(OH)CH_2OCH_2CH(OH)CH_2Q$; and r is an integer of at least 1 but not greater than g; and $X(CF_2)_m$, W and Y are straight chains, branched chains or cyclic; and wherein the substituent chains of the above general formulas are the same or different.

4,193,881

LUBRICANT FOR METAL STRIP

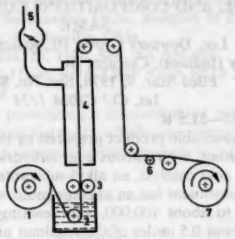
Rudolf Baur, Kreuzlingen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 25, 1978, Ser. No. 936,828

Claims priority, application Switzerland, Sep. 6, 1978, 10845/78

Int. Cl.[2] C10M *5/16, 5/14, 7/22, 7/20*

U.S. Cl. 252—17 **15 Claims**



1. A lubricant for metal strip for the processing of blank and lacquered aluminum or aluminum alloy strip used for packaging purposes, in particular for packaging foodstuffs, said lubricant consisting essentially of a minimum of 60% of the aluminum or magnesium salt of a saturated C_{11} to C_{19} monocarboxylic acid or mixtures thereof as the main constituent and from 10 to 30% of at least one dispersion agent so that said lubricant may be deposited on the surface of the strip from a dispersion.

4,193,882

CORROSION INHIBITED LUBRICANT COMPOSITION

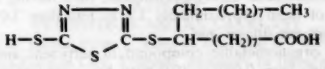
Robert M. Gemmill, Jr., Pitman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 572,480, Apr. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 377,004, Jul. 6, 1973, abandoned. This application Oct. 19, 1978, Ser. No. 952,919

Int. Cl.[2] C10M *1/38*

U.S. Cl. 252—47.5 **8 Claims**

1. A lubricant composition comprising: a major proportion of a lubricating medium selected from the group consisting of oils of lubricating viscosity and greases thereof; and, in an amount sufficient to inhibit metal corrosion, a compound having the formula:



8. A process which comprises reacting oleic acid and 2,5-dimercapto--1,3,4-thiadiazole at a temperature from about 150° C. to about 200° C. and in a mole ratio of 1:1.

4,193,883

LUBRICANT COMPOSITIONS

Gerassimos Frangatos, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,397

Int. Cl.[2] C10M *1/10*

U.S. Cl. 252—49.9 **12 Claims**

1. A reaction product made by (1) reacting, at from about 120° C. to about 225° C., at least about 1 mole of a polyalkenylsuccinic anhydride with each mole of a primary aminopolyhydroxy compound having from 2 to 20 carbon atoms and from 2 to 4 hydroxyl groups and (2) reacting, at from about 80° C. to about 175° C., the material of (1) with a phosphorus trihalide and a polyhydroxyaromatic compound having from 6 to 40

carbon atoms and from 2 to 4 hydroxyl group, the respective molar ratio being about 1 to 3:1 to 3:1 to 3.

6. A lubricant composition comprising oils of lubricating viscosity or greases thereof and an antioxidant or antiwear amount of the product of claim 1.

4,193,884

AMINE DERIVATIVES OF NITROSATED HIGH MOLECULAR WEIGHT ALKYL-SUBSTITUTED PHENOL, AND COMPOSITIONS CONTAINING THE SAME

Richard J. Lee, Downers Grove, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 9, 1978, Ser. No. 884,840
Int. Cl.[2] C10M *1/34*
U.S. Cl. 252—51.5 R **15 Claims**

1. The oil-soluble product prepared by the process comprising, nitrosating, with nitrous acid anhydride gas in the presence of an acid catalyst, an alkyl-substituted phenol, wherein the alkyl-substituent has an average molecular weight of from about 300 to about 100,000, and reacting, from about 0.15 moles to about 0.5 moles of the resultant nitrosated alkyl-substituted phenol with from about 1.0 moles to about 0.5 moles of an amine compound having at least one amino group selected from the class consisting of primary amino and secondary amino.

4,193,885

METHOD FOR PREPARING A THERMAL-STABILITY ADDITIVE AND A THERMALLY STABILIZED METHYLPOLYSILOXANE AND COMPOSITIONS THEREFROM

Roland L. Halm, Saginaw, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 821,251, Aug. 2, 1977, Pat. No. 4,122,109. This application May 26, 1978, Ser. No. 910,706
Int. Cl.[2] C09K *50/00*
U.S. Cl. 252—78.3 **8 Claims**

1. In a heat-transfer system comprising a heat source, a heat exchange, a heat-transfer fluid and means for conveying the heat-transfer fluid between the heat source and the heat exchanger whereby heat is added to the heat-transfer fluid by the heat source and heat is at least partially removed from the heat-transfer fluid by the heat exchanger, the improvement comprising using as the heat-transfer fluid a methylpolysiloxane fluid having improved resistance to thermal siloxane rearrangement, said methylpolysiloxane fluid being prepared by a method comprising

(A) mixing components consisting essentially of

(i) an endblocked methylpolysiloxane fluid having an average of from approximately 1.9 to less than 3.0 methyl groups per silicon, and

(ii) an organometallic compound in sufficient amount to provide from 0.001 to 10.0 parts by weight of the metal per 100 parts by weight of the mixture of (i) plus (ii), said organometallic compound being selected from the group consisting of organotitanium, organozirconium and organohafnium compounds wherein each organic group consists of carbon, oxygen, and hydrogen atoms and which is bonded to the metal by at least one metal-oxygen-carbon linkage,

(B) heating the mixture of (i) plus (ii) in an inert atmosphere to decompose the organometallic compound,

(C) mixing with the mixture of (B)

(iii) an amount of the endblocked methylpolysiloxane fluid (i), said amount being any amount, including none, which is sufficient to reduce the concentration of the metal to a value of from 0.001 to 0.1 parts by weight per 100 parts by weight of the mixture of (C), and

(D) mixing with the mixture of (C),

(iv) an organosilicon hydride compound, soluble in (i) and bearing at least one silicon-bonded hydrogen atom per molecule, the amount of (iv) being from none to an amount sufficient to provide up to 0.05 parts by weight of silicon-bonded hydrogen atoms per 100 parts by weight of the mixture of (C) thereby providing a methylpolysiloxane fluid having an improved resistance to thermal siloxane rearrangement under anhydrous conditions, compared to the methylpolysiloxane (i).

4,193,886

NOVEL LOW TEMPERATURE CLEANER

Daniel Schoenholz, Basking Ridge; Arthur W. Petersen, Chatham Township, Morris County, and Marcus A. Northup, Jr., Morristown, all of N.J., assignors to Church & Dwight Co., Inc., Piscataway, N.J.

Filed Apr. 22, 1976, Ser. No. 679,333
The portion of the term of this patent subsequent to May 6, 1992, has been disclaimed.
Int. Cl.[2] C11D *7/26, 7/12*
U.S. Cl. 252—90 **10 Claims**

1. A weakly alkaline composition for removing soil containing free or combined organic acids comprising (A) at least one polyhydric alcohol or a lower aliphatic ether or ester thereof having at least 2 free hydroxy groups, (B) 1.0 to 500% by weight of at least one alkali metal bicarbonate based on the weight of the polyhydric alcohol and (C) 5.0 to 1000% by weight of at least one alkali metal salt of a weak organic acid based on the weight of the polyhydric alcohol.

4,193,887

FILLED DETERGENT FOAM MADE BY A ONE SHOT PROCESS

Herman Stone, Hazelton, and Peter D. Pauly, Mountaintop, both of Pa., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Continuation-in-part of Ser. No. 780,701, Mar. 24, 1977, Pat. No. 4,124,518. This application Aug. 18, 1978, Ser. No. 935,033
The portion of the term of this patent subsequent to Nov. 7, 1995, has been disclaimed.
Int. Cl.[2] C08G *18/08, 18/14;* C08J *9/12;* C11D *17/04*
U.S. Cl. 252—91 **9 Claims**

1. As an article of manufacture, a filled detergent hydrophilic flexible polyurethane foam, produced by a process which comprises mixing a clay filler and an alkyl aryl sulfonate detergent to form a first mixture, mixing said first mixture with a normally liquid polyether polyol to form a second mixture, and introducing said second mixture, tolylene diisocyanate and water, as a blowing agent, into the mixing chamber of a foam machine whereby a filled detergent polyurethane foam is manufactured, wherein said second mixture contains from 20 to 60 percent by weight of filler, based upon the weight of the polyol, and wherein said second mixture contains from 30 to 80 percent by weight of sulfonate detergent, based upon the weight of the polyol.

4,193,888

COLOR-YIELDING SCOURING CLEANSER COMPOSITIONS

Neil M. McHugh, Jersey City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 426,286, Dec. 18, 1973, abandoned, which is a continuation of Ser. No. 177,158, Sep. 1, 1971, abandoned, which is a continuation of Ser. No. 816,092, Apr. 14, 1969, abandoned. This application Aug. 25, 1978, Ser. No. 937,006
Int. Cl.[2] C11D *7/56*
U.S. Cl. 252—99 **17 Claims**

1. A substantially white scouring cleanser composition capable of undergoing signal color change on contact with aqueous media consisting essentially of, on a weight basis,

(1) from 45 to 95% of a substantially anhydrous water insoluble abrasive material having a particle size within the range of from about 0.001 mm to about 0.4 mm and at least about 85% thereof passes through a seive having 0.074

mm openings, selected from the group consisting of silica, fedspar, pumic volcanic ash, diatomaceous earth, bentonite, calcium carbonate and talc, and mixtures thereof,

(2) from 0.1 to 50% of a bleaching agent capable of liberating hypohalide on contact with aqueous media,

(3) from 0.5 to 30% of a water-soluble organic detergent stable in the presence of said bleaching agent, and

(4) from 0.1 to 10.0% by weight of a coloring agent which is a pigmented carrier capable of undergoing color extension on contact with aqueous media, the pigment being substantially water dispersable selected from the group consisting of water dispersible animal, mineral and synthetic pigments, the particle size of said pigmented carrier being within the range of 50 to 600 microns with 95% passing through a 325 mesh screen, being substantially stable in the presence of said bleaching agent said pigment having a reflectance in the 450 to 535 mm wavelength region of the visible spectrum, the weight ratio of carrier to pigment being from about 1:1 to about 150:1 and wherein said carrier is selected from the group consisting of the abrasive materials defined in (1), water soluble organic detergent, water soluble builder salt, sodium bromide and sodium sulfate.

4,193,889

MICROENCAPSULATION WITH MODIFIED ALIPHATIC POLYISOCYANATES

Gunther Baatz; Walter Schäfer, both of Cologne, and Manfred Dahm, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 29, 1977, Ser. No. 855,743

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1976, 2655048

Int. Cl.[2] B01J *13/02*

U.S. Cl. 252—316 **8 Claims**

1. Microcapsules having walls which comprise a polycondensate of a film-forming aliphatic polyisocyanate containing at least one biuret group or a polyaddition product thereof with a chain-extending agent selected from the group consisting of water, a polyol and a polyamine.

4. A process for the production of microcapsules, wherein a film-forming aliphatic polyisocyanate containing biuret groups, or a solution thereof in an inert solvent, is dissolved or dispersed in materials to be encapsulated, the resulting solution or dispersion is emulsified in water, a tertiary amine initiating the polycondensation reaction or a basically acting compound or an NCO-reactive chain-extending agent is added, the reaction mixture obtained is admixed until the microcapsules are formed, and the microcapsules are isolated.

4,193,890

COLOR STABILIZERS FOR VINYL CHLORIDE RESINS

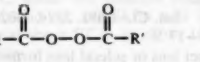
Henri Sidi, Paramus, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Division of Ser. No. 879,416, Feb. 21, 1978, Pat. No. 4,150,219, Continuation-in-part of Ser. No. 784,998, Apr. 6, 1977, Pat. No. 4,139,697. This application Jun. 15, 1978, Ser. No. 916,330

Int. Cl.[2] C09K *15/06*

U.S. Cl. 252—407 **9 Claims**

1. A vinyl chloride-miscible color stabilizer for vinyl chloride resins that contains 50% to 95% by weight of an epoxide selected from the group consisting of vicinal epoxides having 2 to 8 carbon atoms, epoxidized fatty acids having 16 to 18 carbon atoms, esters of these epoxidized fatty acids, and mixtures thereof and 5% to 50% by weight of an organic peroxide having the structural formula



wherein R and R' each represents an alkyl group having 2 to 12 carbon atoms, a chloroalkyl group having 2 to 12 carbon atoms, a bromoalkyl group having 2 to 12 carbon atoms, an aryl group having 6 to 10 carbon atoms, or a haloaryl group having 6 to 10 carbon atoms and 1 to 3 chlorine or bromine atoms.

4,193,891

PASSIVATION OF METALS ON CRACKING CATALYST WITH AN ANTIMONY THIOCARBAMATE

Dwight L. McKay, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 25, 1978, Ser. No. 926,693

Int. Cl.[2] C10G *11/06, 9/16;* C07F *9/90;* B01J *23/18*

U.S. Cl. 252—411 R **15 Claims**

1. A method for passivating a contaminating metal upon a hydrocarbon cracking catalyst, which comprises contacting said catalyst with an antimony thiocarbamate to add the same thereto.

4,193,892

PROCESS FOR PREPARING OLEFIN OXIDE POLYMERIZATION CATALYSTS BY AGING THE CATALYSTS

George L. Goeke, Kendall Park, and Frederick J. Karol, Belle Mead, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 902,566, May 8, 1978, abandoned, which is a continuation of Ser. No. 741,013, Nov. 11, 1976, abandoned. This application Jul. 28, 1978, Ser. No. 928,974

Int. Cl.[2] C08G *59/68, 65/00*

U.S. Cl. 252—428 **8 Claims**

1. In a process for the preparation of an olefin oxide polymerization catalyst comprising:

(i) admixing calcium, ammonia, an alkylene oxide modifier and an organic nitrile modifier, the alkylene oxide consisting of carbon, hydrogen, and oxirane oxygen atoms and the organic nitrile consisting of carbon, nitrogen, and hydrogen atoms, at least one hydrogen atom being acidic, to form a slurry of modified calcium hexammine in ammonia; and

(ii) evaporating ammonia to provide a solid residue,

the improvement comprising:

aging the solid residue at a temperature in the range of about 150° C. to about 225° C. for up to about 15 hours.

4,193,893

TRANSITION METAL CATALYST

Anthony D. Caunt; Peter I. Vincent, and Alan B. Newton, all of Welwyn Garden City, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 688,546, May 21, 1976, abandoned. This application Dec. 2, 1977, Ser. No. 856,985

Claims priority, application United Kingdom, May 28, 1975, 23324/75

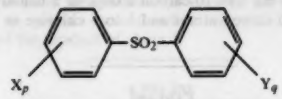
Int. Cl.[2] B01J *31/02*

U.S. Cl. 252—429 B **11 Claims**

1. a process for the treatment of a transition metal compound which comprises grinding a solid compound of a transition metal of Groups IVA to VIA of the Periodic Table with at least 0.01 mole, and not more than one mole, for each gramme atom of the transition metal which is present in the solid compound, of at least one organic compound of the formula

$$R^1COOR^2$$

and also with at least 0.01 mole, and not more than one mole, for each gramme atom of the transition metal which is present in the solid compound, of at least one organo-Lewis Base compound having one of the formulae



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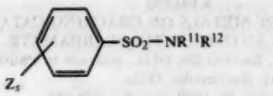
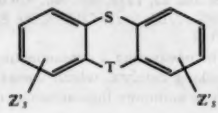


; or



where

R^1 is an alkyl, aryl, alkenyl, aralkyl or alkaryl group;

R^2 is a hydrogen atom or an alkyl, aryl, alkenyl, aralkyl or alkaryl group;

X, or each X, is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a group $—NR^{10}R^{11}$, or two groups X can together form a saturated or unsaturated hydrocarbon ring;

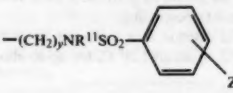
Y, or each Y, is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a group $—NR^{10}R^{11}$, or two groups Y can together form a saturated or unsaturated hydrocarbon ring; or a group X and a group Y may be replaced by a link between the two phenyl groups attached to the $—SO_2—$ group, the linkage being either direct or through a group —O—, $—CH_2—$, $—NR^{10}—$, —S—or —CO—;

R^{10} is a hydrogen atom or a hydrocarbyl group;

R^{11} is a hydrocarbyl group;

Z, or each Z, is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a group $—NR^{10}R^{11}$, or two groups Z can together form a saturated or unsaturated hydrocarbon ring;

R^{12} is a hydrocarbyl group or a group



;

T is —S—, —O—, $—NR^{11}—$; or —CO—;

Z', or each Z', is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio or arylthio group, or a group $—NR^{10}R^{11}$;

p and q are each, independently, an integer from 0 up to 5;

s is an integer from 0 up to 5; and

y is a positive integer.

4,193,894

CATALYST FOR OXIDATION OF SULFUR DIOXIDE

John Villadsen, Vedbek, Denmark, assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 11, 1979, Ser. No. 2,648

Int. Cl.[2] B01J *27/02*; C01B *17/68*

U.S. Cl. 252—440 **25 Claims**

1. A catalytic material for the oxidation of sulfur dioxide to sulfur trioxide at any temperature above 300° C. which comprises a catalyst whose active components are molten at reaction temperature and includes

(1) sulfatized vanadium ions as the catalytically active component;

(2) a first promoter comprising ions of at least one alkali metal said one alkali metal being cesium to stabilize the active vanadium species at temperatures below 420° C.; and

(3) a second promoter comprising ions of at least one metal which does not promote formation of inactive V^4 species and the oxide of which has a heat of formation greater than 100 kcal per oxygen atom and is at least partly soluble in the heavily sulfatized environment of the melt to increase the activity of the catalyst at any temperature;

said catalyst being supported by an inert porous carrier.

4. A catalytic material according to claim 1 wherein said second promoter comprises ions of a metal selected from the group consisting of Al, Mg, Y and La.

8. A catalytic material according to claim 1 wherein said carrier is an inactive silica support.

4,193,895

AROMATIZATION PROCESS AND CATALYST

Steven D. Light, Fullerton, and John W. Ward, Yorba Linda, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 842,221, Oct. 14, 1977, abandoned. This application Aug. 10, 1978, Ser. No. 932,468

Int. Cl.[2] B01J *27/10*

U.S. Cl. 252—441 **10 Claims**

1. A dehydrocyclization-reforming catalyst composition comprising alumina and supported thereon about 0.1–2 wt. % Pt, about 0.1–3 wt. % Cl and sufficient Cs to provide a Cs/Cl atomic ratio between about 0.005 and 0.2.

4,193,896

PROCESS FOR MODIFYING LINEAR POLYMER RESINS

William H. Cook, Bloomfield Hills, Mich., assignor to Kemerica, Incorporated, Bloomfield Hills, Mich.

Filed Apr. 4, 1977, Ser. No. 784,259

Int. Cl.[2] C08J *11/04*

U.S. Cl. 260—2.3 **13 Claims**

1. A process for treating a starting polymer resin composed of repeating hydrocarbon units linked together by amide or ester linear linkages in order to reduce the molecular weight thereof, which comprises treating the linear polymer resin with a basic primary or secondary amine under conditions which cause aminolysis of said linear linkages and recovering as product linear polymer resin also composed of hydrocarbon units linked together by amide or ester linear linkages, but having a lower average molecular weight than said starting linear polymer.

4,193,897

CONTACT LENSES FORMED OF MIXTURES OF CELLULOSE ESTERS AND ETHYLENE/VINYL ACETATE COPOLYMERS

Frank Wingler, Leverkusen; Theobald Eicher, Dormagen; Friedemann Muller, Neuss; Winfried Fischer, Cologne, and Richard Prinz, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 13,468

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2807663

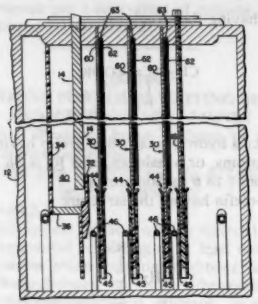
Int. Cl.[2] C08L *1/14*; G02C *7/04*

U.S. Cl. 260—17 R **4 Claims**

1. A contact lens or scleral lens formed of a mixture consisting essentially of

(1) from 99 to 70% by weight of a cellulose ester of at least

one aliphatic carboxylic acid having 1 to 5 carbon atoms and



(2) from 1 to 30% by weight of an ethylene/vinyl acetate copolymer containing from 30 to 98% by weight of incorporated vinyl acetate.

4,193,898

PROTECTIVE COVERING MATERIAL FOR USE SUCH AS SHINGLES AND SIDING

Sidney A. Miller, 821 Midway Dr. NE., Lacey, Wash. 98503

Filed Jan. 19, 1978, Ser. No. 867,798

Int. Cl.[2] C08L *27/06*

U.S. Cl. 260—23 XA **19 Claims**

1. A protective covering material useful as roofing or siding material comprising:

(a) a formulation of 100 parts by weight of the following ingredients:

64 to 80 parts by weight percent of a total 100 of polyvinyl chloride resin; and

20 to 36 parts by weight percent of a total 100 of plasticizer;

(b) the said formulation of polyvinyl chloride resin and plasticizer is admixed as 60 to 90 parts by weight percent of a total 100 with 40 to 10 parts by weight percent of vermiculite.

4,193,899

ELASTOMERIC SYSTEMS HAVING UNUSUAL MEMORY CHARACTERISTICS

Douglas Brenner, Livingston, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 29, 1977, Ser. No. 855,567

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—23.5 A **16 Claims**

1. A process for reshaping a sulfonated elastomeric article from a sulfonated elastomeric blend composition, which includes a neutralized sulfonated elastomeric polymer having about 10 to about 50 meq. metal sulfonate groups/100 grams of said neutralized sulfonated elastomeric polymer and about 2 to about 40 parts by weight of a non-volatile preferential plasticizer per 100 parts by weight of said neutralized sulfonated elstomeric polymer, said process comprising the steps of:

(a) applying sufficient pressure at room temperature to said sulfonated elastomeric article in its original shape so as to deform said sulfonated elastomeric article into a distorted or compressed shape;

(b) heating said sulfonated elastomeric article in said distorted or compressed shape to a temperature of about 50° C. to about 160° C. under said pressure and maintaining said sulfonated elastomeric article in said distorted or compressed shape at about 50° C. to about 160° C. for at least about 1 minute;

(c) cooling said heated sulfonated elastomeric article in such distorted or compressed shape from about 50° C. to about 160° C. to room temperature; and

(d) removing said pressure at room temperature from said sulfonated elastomeric article in said distorted or compressed shape.

7. The product prepared by the process of claim 1, wherein said product contains at least 8 parts by weight of a non-volatile preferential plasticizer per 100 parts by weight of said neutralized sulfonated elastomeric polymer, said neutralized sulfonated elastomeric polymer having about 10 to about 60 meq. of metal neutralized sulfonate groups per 100 grams of said neutralized sulfonated elastomeric polymer, said neutralized sulfonated elastomeric polymer being formed from an EPDM terpolymer having a Mooney viscosity (ML 1+8, 212° F.) of about 10 to about 50, said preferential plasticizer being selected from the group consisting of long chain aliphatic acids having about 12 to about 40 carbon atoms, metallic salts of said long chain aliphatic acids and amides and mixtures thereof.

4,193,900

FIRE CARCASS RESILIENT RUBBER COMPOSITIONS

Lawrence E. Whittington, Round Rock, Tex.; Marvin L. Deviney, Jr.; James E. Lewis, both of Worthington, Ohio, and Duane K. Chapman, Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 828,301, Aug. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 509,172, Sep. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 342,831, Mar. 19, 1973, abandoned. This application Dec. 14, 1978, Ser. No. 969,501

Int. Cl.[2] B60C *1/00*; C08L *9/00, 95/00*

U.S. Cl. 260—28.5 B **5 Claims**

1. In a pneumatic tire carcass or tread-grade rubber compound consisting essentially of a homogenous admixture of (a) an elastomer selected from the group consisting of a styrene-butadiene copolymer, polybutadiene, polyisoprene, an ethylene propylene terpolymer, natural rubber and mixtures thereof; (b) a reinforcing amount of carbon black; (c) an aromatic extender oil in the amount of about 21-42 parts by weight per 100 parts of said elastomer; (d) zinc oxide; (3) stearic acid; (f) sulfur in an amount of not in excess of about 3 parts by weight per 100 parts of said elastomer; and (g) effective amounts of a cure accelerator and an oxidation stabilizer; the improvement of including within the compound as a total or partial replacement of said extender oil component an unoxidized thermal petroleum pitch having a softening point between about 100° and 240° F.

4,193,901

PROCESS FOR THE SULFONATION OF AN ELASTOMERIC POLYMER

Henry S. Makowski, Scotch Plains; Robert D. Lundberg, and Jan Bock, both of Bridgewater, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 950,415, Oct. 11, 1978, which is a continuation of Ser. No. 855,771, Nov. 29, 1977, abandoned. This application Mar. 12, 1979, Ser. No. 19,312

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—28.5 B **17 Claims**

1. In a process for the sulfonation of an unsaturated elastomeric polymer to form a sulfonated elastomeric polymer, wherein a cement consisting essentially of of said unsaturated elastomeric polymer in a non-reactive solvent is contacted with a sulfonating agent in a reaction zone at about −100° C. to about +100° C. for a time sufficient to result in the formation of a sulfonated elastomeric polymer having about 15 to about 50 meq. of sulfonate groups per 100 grams of said sulfonated elastomeric polymer, the improvement which comprises using a sulfonating agent comprising a mixture of a sulfur trioxide donor complexed with a Lewis base and a second reagent being selected from the group consisting of $(RCO)_2O$

and RCOX and mixtures thereof, a molar-ratio of said second reagent to said SO_3 of said complex being at least 0.5, wherein R is selected from the group consisting of CH_3—, C_2H_5—, C_3H_7—, C_4H_9—, C_5H_{11}—, C_6H_{13} and $C_6H_5CH_2$— and mixtures thereof, and X is selected from the group consisting of F, Cl, Br and I.

4,193,902

FINELY PARTICULATE PLASTICS DISPERSIONS PREPARED BY METERING A MIXTURE CONTAINING FOUR MONOMERS INTO AN AQUEOUS LIQUOR CONTAINING AN ANIONIC EMULSIFIER

Josef Mondt, Konigstein; Karl J. Rauterkus, Kelkheim, and Helmut Rinno, Lorsbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 749,440, Dec. 10, 1976, abandoned. This application Jan. 4, 1978, Ser. No. 866,836

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556327

Int. Cl.[2] C08L *33/08*

U.S. Cl. 260—29.6 TA **2 Claims**

1. A process for the preparation of finely particulate plastics dispersions particularly suitable for the solidifying primer coating of substrates to be painted, which comprises metering a monomer mixture containing

I. from 20 to 80% by weight of monomer selected from styrene, methylmethacrylate and mixtures thereof as hardening component, provided that methyl methacrylate, if present, does not exceed 15% by weight of said mixture,

II. from 20 to 80% by weight of monomer selected from acrylic acid and methacrylic acid esters of linear and branched alcohols having from 2 to 8 carbon atoms and mixtures thereof as plasticizing component,

III. from 0.1 to 5% of an amide of an α,β-unsaturated carboxylic acid, and

IV. from 0.1 to 5% of an α,β-unsaturated monocarboxylic acid,

in the form of the pure monomer mixture or a preliminary emulsion, simultaneously with an initiator, into an aqueous liquor containing from 0.5 to 10% by weight of an anionic emulsifier, said monomers being used in such an amount that the solids content of the final dispersion does not exceed 45% by weight, polymerizing said monomers in said aqueous liquor to form said dispersion, and adjusting said dispersion to a pH of 7 to 10.

4,193,903

RAPID REMOVAL OF RESIDUAL MONOMERS FROM ACRYLONITRILE COPOLYMERS

Brandford E. Giddings, Warrensville Heights; Eddie Wardlow, Jr., Cleveland, and Brian L. Mehosky, Maple Heights, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

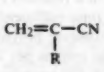
Filed May 17, 1978, Ser. No. 906,538

Int. Cl.[2] C08F *6/24*

U.S. Cl. 260—29.6 R **4 Claims**

1. A process which comprises steam stripping residual nitrile monomer from an aqueous suspension of a resin at a temperature in the range of from about 100° C. up to 135° C. and at a pressure of from about 5 to 30 psig, said resin having been prepared in aqueous suspension by the free-radical polymerization of a mixture of

(A) at least 50% by weight of at least one nitrile monomer having the structure

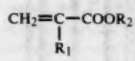


wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and

(B) up to 50% by weight based on the combined weight of (A) plus (B) of at least one member selected from the group consisting of

(1) styrene,

(2) an ester having the structure



wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms,

(3) an alpha-olefin having the structure

wherein R′ and R″ are alkyl groups having from 1 to 7 carbon atoms,

(4) a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers,

(5) vinyl acetate, and

(6) indene.

4,193,904

COPOLYMERIZATION IN WATER SOLUBLE POLYOL WITH CONTROLLED REACTION WITH THE POLYOL AND AQUEOUS COATINGS CONTAINING THE RESULTING COPOLYMER SOLUTION

Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed May 30, 1978, Ser. No. 910,368

Int. Cl.[2] C08K *5/05*

U.S. Cl. 260—29.6 H **5 Claims**

1. A method for the production of a water dispersible copolymer solution in water soluble polyol with controlled limited reaction between the copolymer and the polyol comprising copolymerizing monoethylenically unsaturated monomers including a proportion of carboxyl-functional monomer providing dispersibility in water with the aid of a base and from 0.5%–5%, based on the total weight of monomers, of a monoethylenically unsaturated monomer carrying a reactive group selected from dicarboxylic acid anhydride functionality and N-methylol functionality, in solution in a water soluble polyol having a molecular weight of at least about 300, the copolymerization being carried out or being preceded by conditions causing substantially complete reaction between the said anhydride or N-methylol functionality in the reactive monomer and the hydroxy groups in the polyol.

4,193,905

CURABLE EPOXIDE RESIN MIXTURES CONTAINING DIAMINOPROPANES

Thaddeus Audykowski, and Roland Moser, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

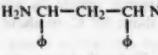
Filed Dec. 2, 1977, Ser. No. 856,893

Claims priority, application Switzerland, Dec. 10, 1976, 15573/76

Int. Cl.[2] C08G *59/50*

U.S. Cl. 260—30.6 R **9 Claims**

1. A curable mixture comprising (a) a polyepoxide compound (x) having on average more than one epoxide group per molecule; and (b) a 1,3-diaminopropane of the formula I

 (I)

wherein 0.5 to 1.5 equivalents of active hydrogen atoms of the 1,3-diaminopropane per 1 equivalent of epoxide groups in the epoxide compound (x) are present.

4,193,906

COMPOSITIONS FOR SOLID WRITING MATERIALS AND WRITING IMPLEMENTS

Akio Hatanaka, Hirakata, Japan, assignor to Sakura Color Products Corporation, Japan

Filed Feb. 14, 1978, Ser. No. 877,580
Int. Cl.[2] C08K 5/10
U.S. Cl. 260—31.2 R **15 Claims**

1. A composition for use as a writing material comprising:
(i) a first component consisting of at least one member selected from the group consisting of dibenzylidene sorbitol, [di-(alkylbenzylidene)] sorbitol, tribenzylidene sorbitol and [tri-(alkylbenzylidene)] sorbitol, said component being present in an amount of about 2 to 12 parts by weight in 100 parts by weight of the total composition,
(ii) a second component consisting of an ester of a mono-saturated fatty acid having 10 to 20 carbon atoms and a mono-saturated aliphatic alcohol having 1 to 8 carbon atoms, said second component being present in an amount of about 10 to 50 parts by weight in 100 parts by weight of the total composition,
(iii) a third component consisting of a vinyl resin, said third component being present in an amount of about 10 to 40 parts by weight in 100 parts by weight of the total composition,
(iv) a fourth component consisting of a coloring agent, said forth component being present in an amount of about 2 to 30 parts by weight in 100 parts by weight of the total composition, and
(v) a fifth component consisting of an organic solvent having a boiling point from about 70° to 220° C., said fifth component being present in an amount of about 30 to 70 parts by weight in 100 parts by weight of the total composition, whereby said composition is shapeable and handleable as a solid under steady or semi-steady conditions but flowable under pressure when used for writing or drawing.

4,193,907

FLAME PROOF POLYAMIDE MOULDING COMPOSITIONS

Peter Tacke; Dieter Neuray, and Dietrich Michael, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 25, 1978, Ser. No. 927,860
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1977, 2734103
Int. Cl.[2] C08K 3/02; C08L 77/00
U.S. Cl. 260—37 N **8 Claims**

1. Flameproof polyamide moulding compositions containing
(I) from 0.5 to 20% by weight of a flameproofing agent comprising a mixture of
(a) from 60 to 95% by weight of at least one phenol/aldehyde resin and
(b) from 5 to 40% by weight of red phosphorus having an average particle size of less than 200μ and
(II) from 10 to 40% by weight of at least one reinforcing material and/or filler.

4,193,908

METHOD OF REDUCING THE VISCOSITY OF POLYESTER-ALUMINA TRIHYDRATE DISPERSIONS BY SLIGHT DEHYDRATION OF TRIHYDRATE

Hsiun P. Hsieh, Murrysville, Pa., and James J. Koenig, Belleville, Ill., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 20, 1978, Ser. No. 944,188
Int. Cl.[2] C08K 3/22
U.S. Cl. 260—40 R **14 Claims**

1. An improved method for dispersing alumina trihydrate, having an average particle size less than 15 microns, in a polyester resin comprising:
lowering the viscosity of the polyester-trihydrate dispersion, by dehydrating the alumina trihydrate to reduce the initial loss on ignition thereof by from 0.2 to 5.0 percent; and
after dehydrating the alumina trihydrate dispersing up to 65 percent alumina trihydrate, based on the total weight of the resin and the trihyrate, with the polyester resin.

4,193,909

FLOWER POT AND METHOD FOR MAKING

John A. Lundberg, Columbus; Robert J. Schafer, Worthington; Richard H. Toeniskoetter, Worthington, and Richard L. Pelfrey, Worthington, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 778,293, Mar. 16, 1977. This application Sep. 21, 1978, Ser. No. 944,507
Int. Cl.[2] C08K 3/36, 9/06
U.S. Cl. 260—42.15 **8 Claims**

1. A molded horticultural container structure prepared by:
(1) forming a uniform admixture of a molding composition comprising:
(a) an aggregate;
(b) up to 10 parts by weight of polyurethane resin binder per 100 parts (a);
(c) from 0.0005–0.1 parts by weight of silane compound per 100 parts (a);
(d) from 0.1–5 parts by weight of iron oxide pigment per 100 parts (a); and
(e) from 0.5–2.5 parts by weight per 100 parts (a) of a powdered thermoplastic polymer having an average particle size of from 20–12000 microns.
(2) molding the resultant admixture to a desired shape;
(3) curing the shaped mixture;
(4) baking said molded structure at a temperature to effect fusing of the powdered thermoplastic polymer component thereof.

4,193,910

PREPARATION OF SUPPORT MATRICES FOR IMMOBILIZED ENZYMES

Ronald P. Rohrbach, Forest Lake, Ill., and Joseph Levy, Deerfield Beach, Fla., assignors to UOP Inc., Des Plaines, Ill.

Filed Oct. 16, 1978, Ser. No. 951,948
Int. Cl.[2] C08K 7/24
U.S. Cl. 260—42.43 **13 Claims**

1. A process for the preparation of an organic-inorganic matrix which comprises adsorbing on a solid, porous, inorganic, water-insoluble support a styrene monomer, polymerizing the sytrene-solid support composite at polymerizing conditions, nitrating the resultant polystyrene-solid support composite, chemically reducing the nitrated polystyrene-solid support composite, and recovering the desired organic-inorganic matrix.

4,193,911

NONINFLAMMABLE OLEFIN FIBER AND METHOD OF PRODUCING SAME

Antonio Fochesato, 260 Summer St., Boston, Mass. 02210

Filed Dec. 27, 1977, Ser. No. 864,459
Claims priority, application Italy, Oct. 5, 1977, 85639 A/77
Int. Cl.[2] C08K 3/22, 5/53, 5/02
U.S. Cl. 260—45.7 P **13 Claims**

1. A noninflammable polypropylene fiber comprising in combination as flame-retartant agents:
(a) from about 1.0% to 12.5% by weight of a hydrated alumina, which alumina has been treated with a lubricant material to permit the alumina to be incorporated into the olefinic resin composition;
(b) from about 1.0% to 5.0% by weight of a halogenated organic polyphosphonate characterized by a phosphorus-

to-carbon bond repeated along the main oligomer chain of the polyphosphonate;

(c) from about 1.0% to 5.0% by weight of a halogenated organic compound selected from the group consisting of

(i) a bromochlorocyclohexane, and

(ii) a 2:1 Diels-Alder adduct of a hexahalocyclopentadiene and a cyclodiene; and

(d) the said fiber being noninflammable when tested by ASTM-D635-74.

4,193,912

PREPARATION OF HIGH-VISCOSITY MIXTURES CONTAINING THERMOPLASTIC POLYESTERS

Werner Schmidt, St. Augustin, and Rüdeger Minke, Troisdorf-Sieglar, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed May 19, 1978, Ser. No. 907,638

Claims priority, application Fed. Rep. of Germany, May 28, 1977, 2724411

Int. Cl.² C08K *3/22*

U.S. Cl. 260—45.75 B **10 Claims**

1. A process for preparing an antimony oxide stabilized polymethylene terephthalate polymeric composition which comprises compounding a polymethylene terephthalate precondensate having a reduced viscosity in the range of 0.4 to 1.2 dl/g with said antimony oxide and thereafter subjecting the resultant composition to solid phase polycondensation until the resultant polycondensate has a reduced viscosity in the range of 1.3 to 2.5 dl/g the antimony trioxide concentration being 1 to 12 weight percent based on the weight of said precondensate.

4,193,913

THERMOPLASTIC VINYL CHLORIDE POLYMERS CONTAINING MONOALKYL-TIN-STABILIZERS

Gerd Abeler, Griesheim Über Darmstadt, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 806,428, Jun. 16, 1977, abandoned, which is a continuation of Ser. No. 639,146, Dec. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 540,924, Jan. 14, 1975, abandoned. This application Feb. 27, 1978, Ser. No. 881,445

Int. Cl.² C08K *5/58*; C07F *7/22*

U.S. Cl. 260—45.75 S **7 Claims**

1. A compound of the formula

$$R—Sn—(S—CH_2COO—n—C_{14}H_{29})_3$$

wherein R is methyl, n-butyl or n-octyl.

4,193,914

PHOSPHORUS-CONTAINING PROPIONATES

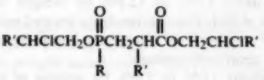
Gail H. Birum, Kirkwood, and Richard F. Jansen, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 945,669, Sep. 25, 1978, which is a continuation-in-part of Ser. No. 855,533, Nov. 28, 1977, abandoned, which is a continuation of Ser. No. 831,707, Sep. 9, 1977, abandoned. This application Apr. 6, 1979, Ser. No. 27,562

Int. Cl.² C08K *5/53*

U.S. Cl. 260—45.85 R **4 Claims**

2. A flame retardant composition comprising a normally flammable material selected from the group consisting of polyamides and polyesters, together with from about 0.1% to 20% by weight of 2-chloroalkyl(2-chloroalkoxy)hydrocarbylphosphinylpropionate of the general formula



where R is phenyl, methyl or ethyl, and R' is hydrogen or methyl.

4,193,915

CONTRACEPTIVE, ANTIBODY GENERATING, POLYPEPTIDES

Kenneth W. McKerns, Blue Hill Falls, Me. 04615

Filed Apr. 13, 1978, Ser. No. 896,225

Int. Cl.² C07C *103/52*; A61K *37/00*

U.S. Cl. 260—112.5 R **28 Claims**

1. A compound R_1-R_2-R_3 and its pharmacologically acceptable salts, wherein R_1 is chosen from the group consisting of D-Ser-Arg, Ser-Arg, and -Arg, R_2 is chosen from the group consisting of Tyr-Gly-Lys-Pro-Val-Gly-Lys-Lys, Ala-Tyr-Pro-Thr-Pro-Ala-Arg-Ser-Lys, Tyr-Gly-Lys-Pro-Val-Gly-Lys-Lys-Lys, Tyr-Gly-Lys-Pro-Val-Arg-Ser-Lys, Tyr-Gly-Pro, Tyr-Gly-Pro-Val-Gly, Val-Leu-Pro, Val-Leu-Val-Gly, Ala-Tyr-Pro, Leu-Pro-Gly-Pro, Val-Leu-Gln-Gly, Ala-Tyr-Pro-Arg-Leu-Pro-Gly, Ala-Tyr-Pro-Arg-Val-Leu-Gln-Gly and Ala-Tyr-Pro-Arg-Val-Leu-Pro, and R_3 is chosen from the group consisting of Val-NH_2, -Val, Lys-NH_2, -Lys, -Thr, Thr-NH_2, -Ser, Ser-NH_2, -Pro and -Pro-NH_2.

4,193,916

SULFO- OR CARBOXY-ARYL AMINO SULFONYL PHENYL AZO HYDROXPYRIDINE HEAVY METAL COMPLEX DYES

Gerhard Back, Lorrach, Fed. Rep. of Germany, and Alfred Fasciati, Bottmingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

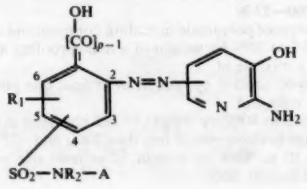
Filed Sep. 28, 1977, Ser. No. 837,138

Claims priority, application Luxembourg, Oct. 8, 1976, 75958; Feb. 7, 1977, 76713

Int. Cl.² C09B *45/16, 45/18, 45/20, 45/22*

U.S. Cl. 260—146 R **6 Claims**

1. A 1:1 or 1:2 copper, nickel, chromium or cobalt metal complex dye of an azo compound of the formula



wherein

A is carboxyphenyl or sulfophenyl which are unsubstituted or substituted by chloro, methyl, methoxy or acetylamino;

p is 1 or 2;

R_1 is hydrogen; chloro; bromo; nitro; C_1–C_4 alkyl; C_1–C_4-alkoxy; C_1–C_4 alkanoylamino; C_1–C_4 alkoxycarbonylamino; or phenoxy which is unsubstituted or substituted by chloro, bromo, methyl, methoxy or nitro;

R_2 is hydrogen or C_1–C_4 alkyl; and with the proviso that one of —R_1 and —SO_2NR_2—A is in the 4-position and the other is in the 5- or 6-position.

4,193,917
CHEMICAL COMPOUNDS

Derek H. R. Barton, London; Alan G. Long; Brian E. Looker, both of Greenford; Edward M. Wilson, Bowness-on-Windermere, and William G. Elphinstone, Stoke Poges, all of England, assignors to Glaxo Laboratories, Limited, Greenford, England

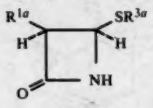
Division of Ser. No. 167,876, Jul. 30, 1971, Pat. No. 3,991,069. This application Aug. 12, 1976, Ser. No. 713,649

Claims priority, application United Kingdom, Jul. 31, 1970, 37186/70; Nov. 3, 1970, 52289/70

Int. Cl.[2] C07D *205/06*

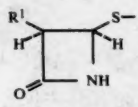
U.S. Cl. 260—239 A 10 Claims

1. A process for the preparation of a compound of the formula



I

wherein R^{1a} and R^{3a} represent groups R^1 and R^4 respectively where R^1 is a blocked amino group of formula —NHCOR where —COR is an acyl group having 1 to 20 carbon atoms and R^3 is an acyl group of formula R^6CO— where R^6 is an alkyl group of 1 to 6 carbon atoms, a phenylalkyl group wherein the alkyl portion has 1 to 6 carbon atoms, a cycloalkyl group of 5 to 7 carbon atoms or a phenyl group; an alkyl group of 1 to 6 carbon atoms, a phenyl group; a phenylalkyl group wherein the alkyl portion has 1 to 6 carbon atoms; a group —SR^5 where R^5 is an alkyl group of 1 to 6 carbon atoms, a phenylalkyl group wherein the alkyl portion has 1 to 6 carbon atoms, a cycloalkyl group of 5 to 7 carbon atoms or a phenyl group; or a group of formula

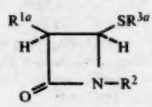


II

where R^1 is as defined above or R^{1a} and R^{3a} together represent the group

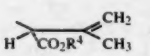
where R is the residue of an acyl group —COR which acyl group has from 1 to 21 carbon atoms, the carbon atom of the group

being bonded to the sulphur atom of the compound of formula I, which process consists of reacting a compound of formula



III

wherein R^2 is a group



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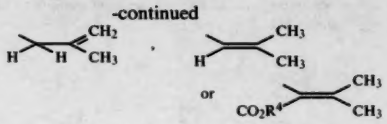
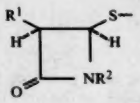


where R^4 is hydrogen or a carboxyl blocking group and R^{1a} and R^{3a} are as defined above except that R^3 can be a group of formula



IV

but not a group of formula II with an alkali metal or alkaline earth metal permanganate.

4,193,918
PROCESS FOR THE PREPARATION OF HYDROXY-ALPHA-AMINO-BENZYL PENICILLIN

Asuncion Esteve Bianchini, and Antonio L. Palomo Coll, both of Barcelona, Spain, assignors to Antibioticos, Madrid, Spain

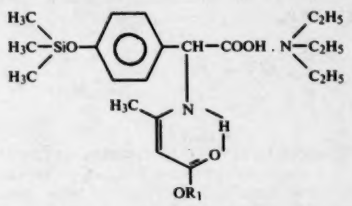
Filed Jun. 1, 1978, Ser. No. 911,513

Claims priority, application Spain, Jun. 4, 1977, 459.494

Int. Cl.[2] C07D *499/68*

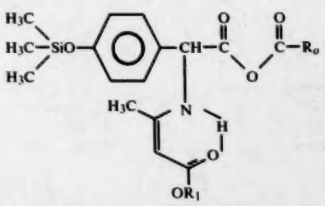
U.S. Cl. 260—239.1 5 Claims

1. Process for the preparation of hydroxy-alpha-amino-benzyl penicillin, characterized in that the conversion product of D(−) p-hydroxy-C-phenylglycine, ethyl or methyl acetylacetate and triethylamine is made to react with 3-trimethylsilyl-2-oxazolidinone to obtain the compound of the following formula I:



(I)

where R_1 is a methyl or ethyl radical, which compound is reacted with a compound selected from the group comprising pivalyl chloride, 2-ethylhexanoyl chloride and alkyl chloroformate to obtain a compound of the following formula II

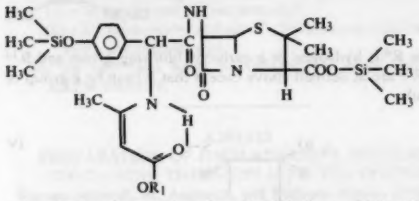


(II)

where R_1 has the meaning given hereinbefore and R_o may be a low molecular weight alkoxy group or an alkyl group having from four to nine carbon atoms and which is thereafter reacted with a compound selected from the group consisting of the triethylamine salt and the trimethylsilyl ester of 6-

aminopenicillanic acid, to obtain an intermediate of the following formula III

(III)



where R_1 has the meaning given hereinbefore, which, with the addition of water and acidulation to pH=0.6 gives a solution of amoxicillin, from which the antibiotic is isolated by precipitation at pH=3.30 to 4.20.

4,193,919

PROCESS FOR PREPARING RIFAMYCIN S USING A STRONG ACID CATION EXCHANGE RESIN

Roger A. Briggs, and Jo Ann Gilpin, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 11, 1979, Ser. No. 29,233

Int. Cl.[2] C07D *491/18, 491/08*

U.S. Cl. 260—239.3 P **4 Claims**

1. A process for converting rifamycin O to rifamycin S which comprises contacting the rifamycin O with a strong acid cation exchange resin in a suitable solvent or solvent mixture containing from about 0.4 percent to about 15 percent water at a temperature of from about 20° C. to about 55° C. for a time sufficient to convert a substantial amount of the rifamycin O to rifamycin S and recovering the rifamycin S.

4,193,920

AZOMETHINE DERIVATIVES OF RIFAMYCIN SV

Rumyana G. Konstantinova; Svetlana S. Zikolova; Velichka I. Apostolova, and Tanya G. Toshkova, all of Sofia, Bulgaria, assignors to DSO "Pharmachim", Sofia, Bulgaria

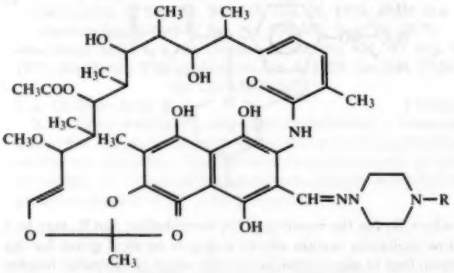
Filed Apr. 11, 1978, Ser. No. 895,399

Claims priority, application Bulgaria, Apr. 15, 1977, 36006

Int. Cl.[2] C07D *491/08*

U.S. Cl. 260—239.3 P **2 Claims**

1. An azomethine rifamycin SV with the formula



where R is biphenylmethyl, cinnamyl, or α-naphthyl-methyl.

4,193,921

PREGNANE DERIVATIVES

Andor Fürst, Basel; Ludwig Labler, Allschwil, and Werner Meier, Bottmingen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

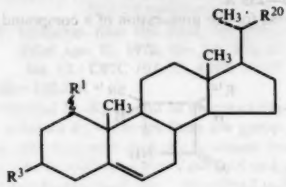
Filed Oct. 12, 1977, Ser. No. 841,430

Claims priority, application Switzerland, Oct. 14, 1976, 13006/76; Sep. 8, 1977, 11011/77

Int. Cl.[2] C07J *71/00*

U.S. Cl. 260—239.55 R **12 Claims**

1. A compound of the formula

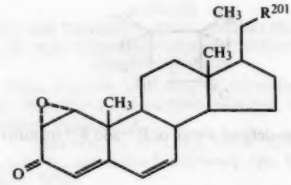


wherein R^1 and R^3 are hydroxy, formyloxy, alkanoyloxy having 2 to 4 carbon atoms or a group of the formula

$$R^XOC(R^J, R^Z)—O—$$

wherein R^J is hydrogen or alkyl having 1 to 6 carbon atoms; R^X and R^Z are alkyl having 1 to 6 carbon atoms or taken together R^X and R^Z are alkylene of 3 to 6 carbon atoms; and R^{20} is hydroxymethyl, formyloxymethyl, alkanoyloxymethyl having 2 to 4 carbon atoms in the alkanoyloxy moiety, bromomethyl, 4-toluenesulfonyloxymethyl, carboxyl or carbalkoxy.

9. A compound of the formula



wherein R^{201} is hydroxymethyl or a group of the formula

$$R^XOC(R^J, R^Z)—O—CH_2—$$

wherein R^J is hydrogen or alkyl having 1 to 6 carbon atoms; R^X and R^Z are alkyl having 1 to 6 carbon atoms or taken together R^X and R^Z are alkylene of 3 to 6 carbon atoms.

4,193,922

SUBSTITUTED-1,2,4-OXADIAZOLIDINE-3-ONE DERIVATIVES

Pál Agócs, Szeged; István Fabián, Sajószentpéter; András Gajdacsi, Szeged; Sándor Nagy, and Zoltán Pintér, both of Miskolc, all of Hungary, assignors to Északmagyarországi Vegyimüvek, Sajóbábony, Hungary

Filed Jun. 8, 1976, Ser. No. 693,892

Claims priority, application Hungary, Jun. 9, 1975, EA 148

Int. Cl.[2] C07D *271/06*

U.S. Cl. 548—132 **8 Claims**

1. 4-(3,4-dichlorophenyl)-5,5-dimethyl-1,2,4-oxadiazolidine-3-one.

4,193,923

TETRAHYDRO 2-CARBAZOLYL METHYL MALONATE DERIVATIVES

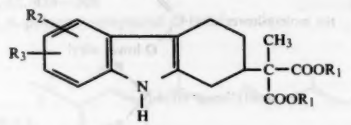
Harvey Gurien, West Orange, and Sidney Teitel, Clifton, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 935,197, Aug. 21, 1978. This application Mar. 23, 1979, Ser. No. 23,114

Int. Cl.[2] C07D *209/82, 209/86*

U.S. Cl. 260—315 **2 Claims**

1. A compound of the formula



IV

wherein R_1 is lower alkyl, R_2 is hydrogen, halogen, trifluoromethyl, hydroxy, lower alkyl, hydroxy-lower alkyl, lower alkylthio, amino, mono-lower alkylamino, or di-lower alkylamino; and R_3 is halogen, trifluoromethyl, lower alkyl, hydroxy-lower alkyl, lower alkoxy, lower alkylthio, hydroxy, amino, mono-lower alkylamino or di-lower alkylamino, or R_2, taken together with an adjacent R_3 is also alkylenedioxy.

4,193,924

PYROLYSIS OF N-SUBSTITUTED-1-CYCLOHEXENE-1,2-DICARBOXIMIDES

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 802,168, May 31, 1977, Pat. No. 4,125,536, which is a division of Ser. No. 603,221, Aug. 8, 1975, Pat. No. 4,056,542, which is a division of Ser. No. 360,962, May 16, 1973, Pat. No. 3,932,457. This application Aug. 21, 1978, Ser. No. 935,201

Int. Cl.[2] C07D *487/04*

U.S. Cl. 260—326 C **5 Claims**

1. The process for preparing N,N'-diphenyl- or N,N'-dialkylpyromellitdiimides which comprises the steps of:

reacting N-phenyl-1-cyclohexene-1,2-dicarboximide with N-phenyl-maleimide or N-alkyl-1-cyclohexene-1,2-dicarboximide with N-alkyl-maleimide in substantially equimolar relationship under pyrolysis conversion conditions to the dimer of respectively N-phenyl-1,3-butadiene-2,3-dicarboximide and N,N'-diphenyl-3,4,5,6-tetrahydropyromellitdiimide or N-alkyl-1,3-butadiene-2,3-dicarboximide and N,N'-dialkyl-3,4,5,6-tetrahydropyromellitdiimide, wherein said pyrolysis conversion conditions include elevated temperatures in the range of about 500° to 1000° C., reduced pressure, and short contact time, effective for said pyrolysis conversion, and

dehydrogenating under dehydrogenation conditions said N,N'-diphenyl- or N,N'-dialkyl-3,4,5,6-tetrahydropyromellitdiimide to said N,N'-diphenyl- or N,N'-dialkyl-pyromellitdiimide.

4,193,925

PROCESS FOR PREPARING 2-PYRROLIDONE

Peter J. N. Meijer, and Johannes G. M. Nieuwkamp, both of Geleen, Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Jan. 18, 1979, Ser. No. 4,474

Claims priority, application Netherlands, Jan. 19, 1978, 7800644

Int. Cl.[2] C07D *207/38*

U.S. Cl. 260—326.5 FN **5 Claims**

1. An improved process for the preparation of 2-pyrrolidone by the liquid phase hydrogenation of succinonitrile by means of a catalyst in the presence of hydrogen and ammonia, the improvement wherein said catalyst is in the form of a fixed bed, and a liquid phase of succinonitrile and liquid ammonia is passed over said catalyst at a temperature within the range of between about 50° and 130° C.

4,193,926

4-(POLYALKOXY PHENYL)-2-PYRROLIDONES

Ralph Schmiechen; Reinhard Horowski; Dieter Palenschat; Gert Paschelke; Helmut Wachtel, and Wolfgang Kehr, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

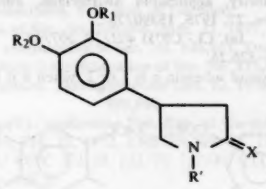
Continuation-in-part of Ser. No. 560,193, Mar. 20, 1975, Pat. No. 4,012,495. This application Feb. 18, 1976, Ser. No. 659,082

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1974, 2413935

Int. Cl.[2] C07D *707/26, 405/12, 409/12*

U.S. Cl. 260—326.5 S **45 Claims**

1. 4-(polyalkoxyphenyl)-2-pyrrolidones of the formula



selected from the group consisting of

4-(3-ethoxy-4-metoxyphenyl)-2-pyrrolidone;
4-(3-propoxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-butoxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-hexyloxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-isopropoxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-(1-methylpropoxy)-4-methoxyphenyl)-2-pyrrolidone;
4-(3-isobutoxy-4-methoxyphenyl)-2-pyrrolidione;
4-(3-allyloxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-(3-methyl-2-butenyloxy)-4-methoxyphenyl)-2-pyrrolidone;
4-(3-methoxymethoxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-(2-hydroxyethoxy)-4-methoxyphenyl)-2-pyrrolidone;
4-(3-(2,2,2-trifluoroethoxy)-4-methoxyphenyl)-2-pyrrolidone;
4-(3-benzyloxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-phenoxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-methoxy-4-ethoxyphenyl)-2-pyrrolidone;
4-(3-methoxy-4-butoxyphenyl)-2-pyrrolidone;
1-acetyl-4-(3,4-dimethoxyphenyl)-2-pyrrolidone;
4-(3-decyloxy-4-methoxyphenyl)-2-pyrrolidone;
4-83-octadecyloxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-(2-methylbutyl)-oxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-neopentyloxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-isopentyloxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-(2-propinyl)-oxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-cyanomethyloxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-cyclobutoxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-cyclopentyloxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-cyclohexyloxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-(3-methylcyclopentyl)-oxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-(2-methylcyclopentyl)-oxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-(3-tetrahydrothienyl)-oxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-(3-tetrahydrofuryl)-oxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-cyclopropylmethyloxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-cyclopentylmethyloxy-4-methoxyphenyl)-2-pyrrolidone;
4-(3-methallyloxy-4-methoxyphenyl)-2-pyrrolidone;
4-(4-propinyloxy-3-methoxyphenyl)-2-pyrrolidone;

4-(4-cyclopentyloxy-3-methoxyphenyl)-2-pyrrolidone;
4-(3,4-diethoxyphenyl)-2-pyrrolidone;
4-(3,4-diisobutoxyphenyl)-2-pyrrolidone;
4-(3-isobutoxy-4-methoxyphenyl)-pyrrolidine-2-thione;
4-(3-cyclopentyloxy-4-methoxyphenyl)-pyrrolidine-2-thione; and
4-(3-(2-tetrahydrofuryloxy)-4-methoxyphenyl)-2-pyrrolidone.

4,193,927

IMIDYL COMPOUNDS

Marcus Baumann, Basel; Vratislav Kvita, Muttenz; Martin Roth, Basel, all of Switzerland, and John S. Waterhouse, Cherry Hinton, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

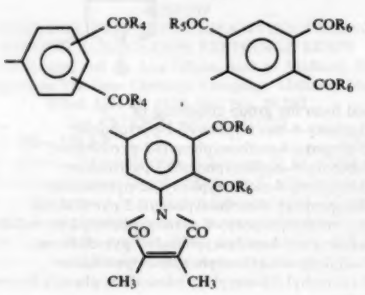
Division of Ser. No. 696,346, Jun. 15, 1976, Pat. No. 4,107,174. This application Apr. 21, 1978, Ser. No. 898,754

Claims priority, application Switzerland, Jun. 18, 1975, 07951/75; Nov. 27, 1975, 15390/75

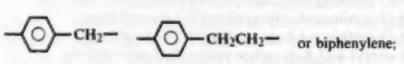
Int. Cl.[2] C07D *403/10, 207/44*

U.S. Cl. 260—326.26 **7 Claims**

1. A compound wherein n is 1 or 2, when n is 1, X is



or glycidyl, where R_5 and the two R_4's each denote OH, Cl or alkoxy of 1 to 12 carbon atoms; and the two R_6's have the same meaning as R_4 or conjointly represent —O—; and when n is 2, Y is phenylene, 1,4-cyclohexylene, naphthtlene,



or biphenylene;

4,193,928

LASALOCID DERIVATIVES

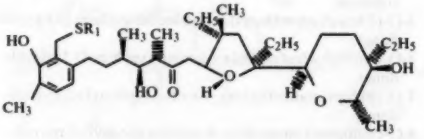
David Coffen, Glen Ridge, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 836,350, Sep. 26, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,645

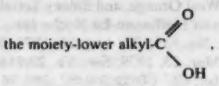
Int. Cl.[2] C07D *309/06, 309/04, 213/70*

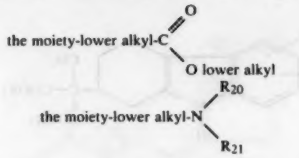
U.S. Cl. 260—345.7 R **13 Claims**

1. A compound of the formula



wherein R_1 is selected from the group consisting of phenyl, tolyl or halo, alkoxy or nitro mono-or di-substituted phenyl, benzyl, pyridyl, furyl, C_4 to C_7 cycloalkyl, lower alkyl, C_2 to C_6 lower alkenyl,





wherein R_{20} and R_{21} are hydrogen or lower alkyl, hydroxy lower alkyl, alkoxyalkyl, the moiety-lower alkyl-S-lower alkyl and hydrogen.

4,193,929

EPOXIDATION

Anthony M. Hildon, Tattenhall, and Peter F. Greenhalgh, Widnes, both of England, assignors to Propylox a Societe Anonyme, Brussels, Belgium

Filed Oct. 6, 1977, Ser. No. 839,887

Claims priority, application United Kingdom, Oct. 26, 1976, 44452/76

Int. Cl.[2] C07D *301/14*

U.S. Cl. 260—348.25 **10 Claims**

1. A continuous process for the epoxidation of an alkene by reaction with a peroxycarboxylic acid to produce an oxirane, comprising:

(i) preparing a solution comprising peroxycarboxylic acid and organic solvent;

(ii) mixing an alkene and said solution comprising peroxycarboxylic acid and organic solvent;

(iii) reacting said peroxycarboxylic acid and said alkene to produce a product mixture;

(iv) distilling said product mixture such that unreacted alkene is separated therefrom in gaseous form;

(v) absorbing said gaseous alkene in said solution comprising peroxycarboxylic acid and organic solvent before step (ii); and

(vi) purifying the product mixture, after removal of the alkene, to produce the oxirane.

4,193,930

25-ALKYL-3β-HYDROXYCHOLEST-5-EN-7-ONES AND ESTERS THEREOF

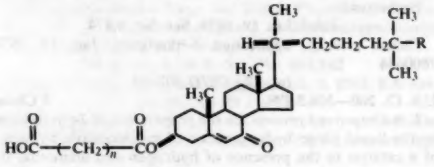
Robert J. Chorvat, Arlington Heights, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 828,385, Aug. 29, 1977. This application Jul. 28, 1978, Ser. No. 928,664

Int. Cl.[2] C07J *9/00*

U.S. Cl. 260—397.2 **2 Claims**

1. A compound having the formula



wherein n represents a positive integer less than 4 and R represents alkyl containing fewer than 5 carbons.

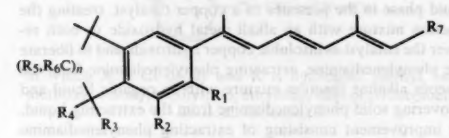
4,193,931

POLYENE COMPOUNDS

Peter Loeliger, Kaiseraugst, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 24, 1978, Ser. No. 899,427
Claims priority, application Luxembourg, May 4, 1977, 77254
Int. Cl.[2] C11C *3/02*
U.S. Cl. 424—308 **21 Claims**

1. A polyene compound of the formula:



I

wherein R_1 and R_2 each are hydrogen, halogen or lower alkoxy; R_3, R_4, R_5 and R_6 each are hydrogen or lower alkyl; R_7 is hydroxymethyl, lower alkoxymethyl, lower alkanoyloxymethyl, carboxyl, lower alkoxycarbonyl, mono(lower alkyl)-carbamoyl or di(lower alkyl)carbamoyl; and n is 1 or 2 or the alkali metal salts thereof.

4,193,932

PROCESS FOR PREPARING ORGANIC ISOCYANATES

Ryuichi Yamamoto, Enmeiji; Kousuke Yamamoto, Toritsuka; Teruyuki Nagata, Kamishirakawa, and Kenji Obata, Toritsuka, all of Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo, Japan

Filed Oct. 27, 1978, Ser. No. 955,266
Claims priority, application Japan, Nov. 11, 1977, 52-134692
Int. Cl.[2] C07C *118/02*
U.S. Cl. 260—453 PH **15 Claims**

1. In a process for preparing an organic isocyanate including reacting an organic amine with phosgene to yield a reaction product containing the corresponding organic isocyanate and subjecting said reaction product to purification, the improvement which comprises passing hydrogen chloride gas through said reaction product in the presence of an inert organic solvent whereby the gas included in said reaction product is removed and the acid substances and hydrolyzable chlorine-containing substances included therein are minimized.

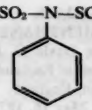
4,193,933

N-(2-FLUORO-1,1,2,2-TETRACHLOROETHYLTHIO)-N-PHENYL METHANE SULFONAMIDES AND THEIR USE IN CONTROLLING PESTS

Peter F. Epstein, Overland Park, Kans., and Willis C. McGuire, Lafayette, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 517,721, Oct. 24, 1974, abandoned, which is a continuation of Ser. No. 393,537, Aug. 31, 1973, abandoned, which is a continuation of Ser. No. 198,029, Nov. 9, 1971, abandoned, which is a continuation of Ser. No. 69,957, Sep. 4, 1970, abandoned, which is a continuation of Ser. No. 672,969, Oct. 5, 1967, abandoned, which is a continuation-in-part of Ser. No. 512,781, Dec. 9, 1965, abandoned. This application Feb. 9, 1976, Ser. No. 657,019
Int. Cl.[2] C07C *119/00*
U.S. Cl. 260—453 RW **1 Claim**

1. The compound having the formula



in which R_1 is methyl, R_2 is hydrogen and n is 1.

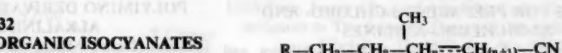
4,193,934

NITRILES WITH ODORANT PROPERTIES

Kurt Bauer; Ulli Harder, and Wolfgang Sturm, all of Holzminden, Fed. Rep. of Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Fed. Rep. of Germany

Continuation of Ser. No. 779,665, Mar. 21, 1977, abandoned, which is a continuation of Ser. No. 636,881, Dec. 2, 1975, abandoned, which is a continuation of Ser. No. 415,896, Nov. 14, 1973, abandoned. This application Oct. 12, 1978, Ser. No. 950,896
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1972, 2256483; Feb. 23, 1973, 2308735; Sep. 26, 1973, 2348359
Int. Cl.[2] C07C *121/68, 121/70, 121/46;* C11B *9/00*
U.S. Cl. 260—465 R **9 Claims**

1. Compound of the formula



(I)

in which

n stands for 0 or 1 and, where n stands for 0, a double bond is present as indicated by the chain line and,

R represents phenyl which may optionally be substituted in the p-position by alkyl of 1–5 carbon atoms.

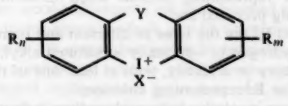
4,193,935

NOVEL OXIODINIUM AND THIAIODINIUM COMPOUNDS

William N. Cannon, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 16,589, Mar. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 270,545, Apr. 4, 1963, abandoned, which is a continuation-in-part of Ser. No. 654,656, Jul. 19, 1967, Pat. No. 3,506,719. This application Mar. 2, 1973, Ser. No. 337,345
Int. Cl.[2] C07C *143/24, 149/00;* A01N *9/00, 9/24*
U.S. Cl. 260—505 R **4 Claims**

1. A compound represented by the following formula:



wherein Y is oxygen or sulfur;

R is lower alkyl, trifluoromethyl or halo;

n and m are numbers from 0 to 3; and

X^- is C_1-C_3 alkylsulfonate.

4,193,936

N-SUBSTITUTED PARAMENTHANE CARBOXAMIDES

Hugh R. Watson, Wargrave; David G. Rowsell, Staines, and David J. Spring, Datchet, all of England, assignors to Wilkinson Sword Limited, London, England

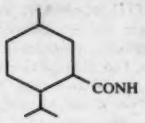
Division of Ser. No. 796,973, May 16, 1977, Pat. No. 4,150,052, which is a continuation of Ser. No. 486,566, Jul. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 221,755, Jan. 28, 1972, abandoned. This application Jan. 18, 1979, Ser. No. 4,319

Claims priority, application United Kingdom, Feb. 4, 1971, 3928/71; Feb. 4, 1971, 3934/71

Int. Cl.[2] C07C *103/737*; A61K *31/16*

U.S. Cl. 260—557 R 5 Claims

1. Substantially odorless, non-volatile physiologically active cooling compounds of the formula



where

R is C_1–C_9 alkyl, C_3–C_7 cycloalkyl or a substituted phenyl radical of up to 10 carbon atoms containing as substituents one or more groups selected from C_1–C_4 alkyl, hydroxy, C_1–C_4 alkoxy, nitro and halogen.

4,193,937

PROCESS FOR PREPARING 3-CHLORO- AND 3,5-DICHLORO-ANILINES

Karlfried Wedemeyer, Cologne; Wolfgang Kiel, Schildgen, and Werner Evertz, Monheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

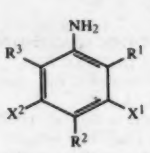
Continuation of Ser. No. 647,966, Jan. 9, 1976, abandoned. This application Sep. 15, 1978, Ser. No. 942,711

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1975, 2503145

Int. Cl.[2] C07C *87/52, 87/60, 93/00, 93/08*

U.S. Cl. 260—570 R 24 Claims

1. Process for preparing anilines meta-substituted by chlorine which comprises reacting chloroanilines having the formula



wherein

X^1 and X^2 are the same or different and represent chlorine, hydrogen or optionally substituted alkyl, aryl, aralkyl, alkoxy or aralkoxy, with one of the radicals X^1 or X^2 representing chlorine when 3-chloroanilines are being prepared and

X^1 and X^2 representing chlorine when 3,5-dichloroanilines are being prepared and

R^1, R^2 and R^3 are the same or different and represent chlorine, hydrogen or optionally substituted alkyl, aryl, aralkyl, alkoxy or aralkoxy, with at least one of the radicals R^1, R^2 or R^3 representing chlorine,

with hydrogen in solution in an acid medium in the presence of noble metals which are in the elementary form or in the form of compounds and are optionally applied to supports, and in the presence of sulfur or sulfur compounds at elevated temperatures and under pressure, said chloroaniline being introduced into a reaction vessel and the pH of the contents thereof being adjusted to less than 6.5 before addition of hydrogen.

4,193,938

EXTRACTION OF PHENYLENEDIAMINE FROM AQUEOUS ALKALINE SOLUTION

Preston S. White, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 8, 1978, Ser. No. 884,522

Int. Cl.[2] C07C *85/26*

U.S. Cl. 260—582 5 Claims

1. In a process for the preparation of a solid phenylenediamine by reacting a dichlorobenzene with ammonia in the liquid phase in the presence of a copper catalyst, treating the reaction mixture with an alkali metal hydroxide to both recover the catalyst as insoluble copper hydroxide and to liberate free phenylenediamine, extracting phenylenediamine from the aqueous alkaline reaction mixture with an organic liquid and recovering solid phenylenediamine from the extracting liquid, the improvement consisting of extracting phenylenediamine from the aqueous alkaline reaction mixture by liquid-liquid extraction with a C_1 chlorinated solvent selected from the group consisting of methylene chloride, chloroform and carbon tetrachloride.

4,193,939

PROCESS FOR THE SYNTHESIS OF MIXED POLYIMINO DERIVATIVES OF ALUMINUM AND ALKALINE EARTH METALS

Giovanni Dozzi, Milan; Salvatore Cucinella, and Alessandro Mazzei, both of San Donato Milanese, all of Italy, assignors to Anic S.p.A., Palermo, Italy

Division of Ser. No. 831,240, Sep. 7, 1977. This application Jan. 3, 1979, Ser. No. 678

Claims priority, application Italy, Oct. 28, 1976, 28776 A/76; Oct. 28, 1976, 28777 A/76

Int. Cl.[2] C07C *83/00*

U.S. Cl. 260—583 R 3 Claims

1. A process for preparing a magnesium amide consisting of reacting magnesium with a primary or secondary aliphatic amine in the presence of hydrogen having a pressure of about 130 kg/cm^2 or greater at ambient temperature, the reaction being carried out at a temperature greater than or equal to about 50° C.

4,193,940

14 β-HYDROXYANDROSTANES

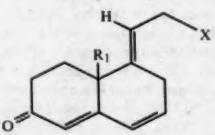
Zdenek Valenta, Fredericton, Canada, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 811,393, Jun. 29, 1977, Pat. No. 4,134,920. This application Oct. 12, 1978, Ser. No. 950,930

Int. Cl.[2] C07C *49/48*; C07J *1/00*

U.S. Cl. 260—586 F 2 Claims

1. A compound of the formula



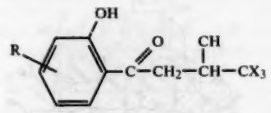
wherein R_1 is lower alkyl and X is bromo or chloro and the optical antipodes and geometrical isomers thereof.

4,193,941
1,1,1-TRIHALO-2-HYDROXY-4-(2-HYDROXYPHENYL)-4-BUTANONES

Sidney H. Levinson, Philadelphia, and Wilford L. Mendelson, King of Prussia, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 843,371, Oct. 19, 1977, Pat. No. 4,152,517. This application Oct. 5, 1978, Ser. No. 948,731
Int. Cl.[2] C07C *49/82*
U.S. Cl. 260—592 3 Claims

1. The compound of the formula:



in which X is Cl or Br and R is hydrogen, methyl, ethyl, methoxy, ethoxy, methylthio, ethylthio, halo or trifluromethyl.

4,193,942
PROCESS FOR CATALYTIC CONVERSION OF OLEFINICALLY UNSATURATED COMPOUNDS WITH HYDROGEN AND/OR CARBON MONOXIDE

Leendert A. Gerritsen, Delft, and Joseph J. F. Scholten, Geleen, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Jan. 18, 1978, Ser. No. 870,582
Claims priority, application Netherlands, Jan. 20, 1977, 7700554; Nov. 17, 1977, 7712648
Int. Cl.[2] C07C *45/08*
U.S. Cl. 260—604 HF 7 Claims

1. In a process for the hydroformylation of the olefinically unsaturated organic compound containing 2 to 20 carbon atoms to produce the corresponding aldehyde having an additional carbon atom by reaction of said compound with hydrogen and carbon monoxide at a temperature of between 20° C. and 300° C. and at a pressure of between 1 and 100 bar in the presence of a catalyst consisting of a solid, porous carrier in the pores of which a catalytically active metallo-organic complex, containing as the central metal atom at least one metal selected from the group consisting of rhodium, cobalt, ruthenium and iridium, dissolved in a solvent of low volatility under the reaction conditions, is present,

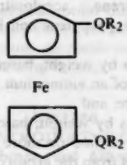
the improvement comprising using a catalyst wherein said catalytically active metallo-organic complex is present in the pores of the carrier in the form of a solution in at least one ligand-forming electron-donating phosphorous compound with a vapor pressure of less than 15 mbar under the reaction conditions, having the formula $PR^1R^2R^3$ or $P(OR^1)(OR^2)(OR^3)$ in which R^1, R^2 and R^3, independent of each other, or together, represent a C1 to C20 hydrocarbon group, the concentration of the complex being between 0.1 to 0.00001 moles of complex per liter of solvent.

4,193,943
HYDROFORMYLATION CATALYSTS

Jerry D. Unruh, and William J. Wells, III, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 650,405, Jan. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 569,738, Apr. 21, 1975, abandoned. This application Apr. 24, 1978, Ser. No. 898,734
Int. Cl.[2] C07C *45/08*
U.S. Cl. 260—604 HF 50 Claims

1. In the hydroformylation of an olefin having up to about 25 carbon atoms with hydrogen and carbon monoxide in a liquid-phase reaction zone to produce an aldehyde derivative of said olefin, said hydroformylation being conducted at a temperature from about 50° C. to about 200° C., under a combined partial pressure of hydrogen and carbon monoxide of from about one atmosphere to about 1000 pounds per square inch, and with the ratio of hydrogen partial pressure to that of carbon monoxide being from about 10:1 to 1:10, the improvement which comprises catalyzing said hydroformylation with rhodium hydrido carbonyl in complex combination with a ferrocene derivative of the structure



wherein Q is P, As, or Sb and R is phenyl or lower alkyl.

4,193,944
PURGING OF INERTS IN CHLORINATED HYDROCARBON PRODUCTION

Utah Tsao, Jersey City, and Angel Sy, Cedar Park, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Jun. 15, 1978, Ser. No. 915,896
Int. Cl.[2] C07C *17/00*
U.S. Cl. 260—659 R 10 Claims

1. In a process for producing chlorinated hydrocarbons, the improvement comprising:

(a) recovering from a chlorinated hydrocarbon production zone an effluent containing chlorinated hydrocarbon, unreacted alkane, and inerts, said chlorinated hydrocarbons including waste chlorinated hydrocarbon byproduct;

(b) introducing the effluent into a separation and recovery zone;

(c) recovering in the separation and recovery zone a purge gas containing a portion of the inerts, a portion of the unreacted alkane and a portion of the chlorinated hydrocarbons;

(d) contacting the purge gas with a first absorption oil recovered from the effluent to absorb chlorinated hydrocarbon, said first absorption oil being at least one chlorinated hydrocarbon boiling at a temperature of at least 140° F.;

(e) introducing first absorption oil, containing absorbed components into at least one of the chlorinated hydrocarbon production zone and the separation and recovery zone;

(f) contacting purge gas from step (d) with a second absorption oil which is higher boiling than the first absorption oil, said second absorption oil being a first portion of said waste chlorinated hydrocarbon byproduct;

(g) introducing second absorption oil containing absorbed components into the separation and recovery zone to recover second absorption oil and absorbed components;

(h) introducing purge gas from step (f), oxygen and a second portion of the waste chlorinated hydrocarbon byproduct into a combustion zone to effect combustion of waste chlorinated hydrocarbon byproduct and utilize alkane present in the purge gas as fuel to thereby produce a gas containing gaseous chlorine values selected from the group consisting of chlorine, hydrogen chloride and mixtures thereof, as well as inerts; and

(i) recovering the chlorine values and purging the inerts.

4,193,945

SELF-EXTINGUISHING POLYMERIC COMPOSITIONS

Guido Bertelli; Pierpaolo Roma, and Renato Locatelli, all of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed May 25, 1977, Ser. No. 800,569
Claims priority, application Italy, May 28, 1976, 23748 A/76
Int. Cl.[2] C08K 3/32, 5/34; C08L 23/16, 77/00
U.S. Cl. 525—2 18 Claims

1. Self-extinguishing polymeric compositions comprising a polymer selected from the group consisting of polypropylene, polyethylene, polystyrene, acrylonitrile-butadiene-styrene resins and blends of polypropylene and EPDM rubber, and a combination of

(1) from 5 to 30 parts by weight, based on 100 parts of the total composition, of an ammonium phosphate or ammonium polyphosphate; and

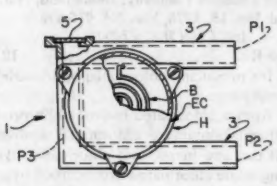
(2) from 3 to 20 parts by weight, based o 100 parts of the total composition, of one or more nitrogen containing compounds selected from the group consisting of (a) those containing >C=O and/or >C=S and >NH inserted in a cyclic structure; (b) polyamides, and (c) water insoluble reaction products of compound (a) with an aliphatic aldehyde.

4,193,946

MEANS FOR INCREASING CHOKE VALVE OPENING RATE

S. Owen Dye, Highland, Ill., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 1, 1978, Ser. No. 965,257
Int. Cl.[2] F02M 1/10
U.S. Cl. 261—39 B 2 Claims



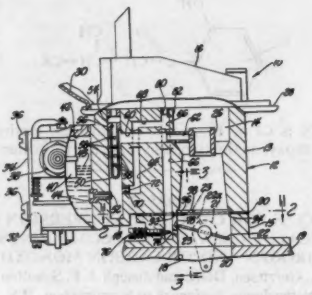
1. In a carburetor for an internal combustion engine, the carburetor having an unbalanced choke valve positioned at the inlet end of an air induction passage, a shaft on which the choke valve is mounted, a bi-metal coil to which the shaft is connected, the coil being responsive to engine temperature to exert a closing force on the choke valve which lessens as engine temperature increases whereby the choke valve gradually opens, a closed housing in which the coil is mounted, the housing being mounted to the body of the carburetor, and means for heating the bi-metal coil when the engine is running thereby to open the choke valve, the improvement comprising means for decreasing the rate at which the choke valve closes after the engine is shut off, the means including means defining first and second spaced apart horizontal passages respectively extending through the housing at the upper and lower ends thereof, the passages being substantially parallel to each other, a third passage extending vertically through the housing and communicating at each end with one end of the respective first and second passage and means connecting the other end of the first and second passages to a water circulating passage in the engine whereby water circulating through the engine flows through the first, second, and third passages and some of the water heat is transmitted to the housing and the bi-metal coil so the coil cools at a slower rate than that at which it otherwise cools, the three passages being inward of the bi-metal coil when the housing is mounted on the carburetor body, the water connecting means connecting to the outer end of both the first and second passages and the third passage connecting at each end with a respective inner end of the first and second passages.

4,193,947

CARBURETING DISCHARGE MEANS

Ralph Bugamelli, Sterling Heights, Mich., assignor to Colt Industries Operating Corp., New York, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,504
Int. Cl.[2] F02M 3/08
U.S. Cl. 261—41 D 1 Claim

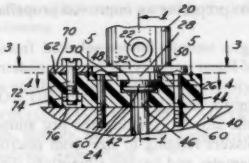


1. A carburetor, comprising body means, said body means comprising a main body section and a throttle body section operatively connected to each other, a generally cylindrical air induction passage means formed through said main body section and said throttle body section, an annular venturi restriction in that portion of said passage means, formed in said main body section, a main fuel nozzle for discharging main fuel into said passage at said venturi, an idle fuel discharge port in said throttle body section as to communicate with said passage means downstream from said nozzle for discharging idle fuel into said passage means, a butterfly throttle valve pivotally mounted in said passage means as to be carried by said throttle body section and situated between said venturi and said discharge port, a transfer fuel port formed in and carried by said throttle body section at one side of said passage means for discharging transfer fuel into said passage, said transfer port being disposed downstream of said venturi and adjacent said throttle valve so as to be traversed by an edge of said throttle valve upon opening movement thereof, gasket means having upper and lower planar surfaces situated and retained between said main body section and said throttle body section as to have said upper planar surface juxtaposed to said main body section and said lower planar surface juxtaposed to said throttle body section, said gasket means having an aperture formed therethrough as to have the periphery of said aperture for the major portion thereof closely conform to the axially transverse cross-sectional configuration of said passage means immediately upstream and downstream of said gasket means, said gasket means further comprising an air turbulence generating planar portion projecting radially inwardly of said passage means and terminating in a projecting edge which edge extends to and from said periphery of said aperture, said upper planar surface extending to and terminating in said projecting edge, said lower planar surface extending to and terminating in said projecting edge, said turbulence generating planar portion being situated immediately upstream of said transfer port as to thereby result in having the air flowing in said passage means immediately upstream of said turbulence generating portion impinge upon said extending upper planar surface thereof and by resulting turbulence be deflected generally radially inwardly of said passage means as to continue its flow through said passage means only after passing around said projecting edge.

4,193,948
MOUNTING STRUCTURE FOR PLASTIC CARBURETORS

Richard P. Charmley, Caro, and William A. Scott, Cass City, both of Mich., assignors to Walbro Corporation, Cass City, Mich.

Filed Dec. 26, 1978, Ser. No. 972,777
Int. Cl.[2] F02M *19/00*
U.S. Cl. 261—65 **6 Claims**

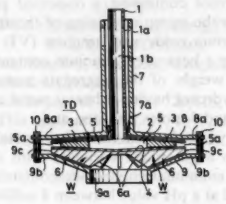


1. A carburetor retention device for plastic carburetors to eliminate body distortion which comprises:
(a) a carburetor body having spaced recesses formed therein adjacent a surface to be mounted to an engine,
(b) a forked elongate clamp having legs to seat in and straddle said recesses and having a portion spaced from said legs adapted to be fastened adjacent an engine to retain said carburetor through the pressure of said legs on said body, and
(c) an acircular projection on said body to be received in a complemental recess to stabilize the carburetor body against turning.

4,193,949
APPARATUS FOR GENERATING FINELY DIVIDED PARTICULATE BUBBLES

Makoto Naito, 15-22, Kami-Soshigaya 2-chome, Setagaya-ku, Tokyo, Japan

Filed Jun. 13, 1978, Ser. No. 915,140
Claims priority, application Japan, Jun. 23, 1977, 52-81742[U]; Jun. 23, 1977, 52-81743[U]
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—87 **4 Claims**

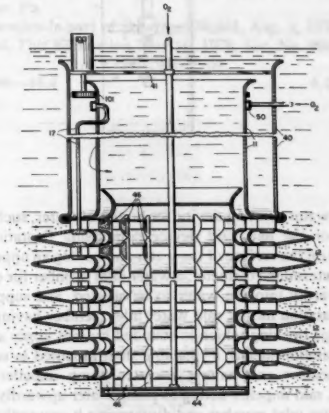


1. An apparatus for generating finely divided particulate bubbles comprising:
an outer body including a hollow shaft and a cavity defining means carried thereby, said shaft being apertured for fluid communications with a gas and said cavity being apertured adjacent the axis of said hollow shaft for fluid communication with a liquid, and being apertured for expulsion of an admixture of gas and liquid at a point radially outwardly of the axis of said hollow shaft, the interior of said shaft and said cavity being in fluid communication with each other;
an inner body including a shaft and a plurality of vanes, said inner body being carried by said outer body with the shaft of said inner body journaled for rotation within the hollow shaft of said outer body, the vanes of said inner body disposed within the cavity of said outer body, said plurality of vanes comprising:
a generally horizontal disc carried by said inner body and,
a plurality of paddles extending downwardly along equally spaced radials of said lower disc,
the spacing between the lower edge of said paddles and the lower internal surface of said cavity defining means being substantially constant,
said paddles having a wider vertical dimension from a radially intermediate point than at either radial end, and said radially intermediate point being adjacent the radially outer circumference of the aperture in said cavity defining means.

4,193,950
APPARATUS FOR INTRODUCING GAS INTO A LIQUID

Josef Stockner, Baierbrunn, and Alfred Wildmoser, Munich, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 702,052, Jul. 2, 1976, Pat. No. 4,117,048. This application Apr. 12, 1978, Ser. No. 895,641
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1975, 2530050
The portion of the term of this patent subsequent to Sep. 26, 1995, has been disclaimed.
Int. Cl.[2] C02B *1/34, 3/08;* C02C *5/04*
U.S. Cl. 261—87 **4 Claims**



1. A device for dispersing gas in a liquid in the aeration of swage in a clarifier tank, comprising:
a plurality of aerodynamically spaced ribs defining between them venturi passages;
means for inducing a flow of liquid through said passages, said passages progressively converging from an upstream side to a constricted portion, thereafter diverging to a downstream side of the respective passage;
gas permeable means along at least one surface of each of said ribs bounding a respective one of said passages in the region of the respective constriction for feeding gas to the liquid in a direction substantially perpendicular to the direction of liquid flow through the respective passage;
a vertical duct open at its upper end and formed at its lower end with said ribs, said ribs being axially spaced horizontal rings, said means for inducing liquid flow through said passages including an axial intake, radial outflow pump having a rotor coaxial with said rings for dispacing liquid between them, said rotor being formed with aerodynamically shaped members which function as radial vanes; and
means for holding said vanes stationary while rotating said ribs.

4,193,951

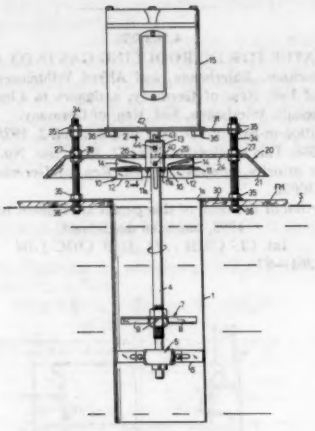
WATER AERATING DEVICE

Carl F. Stanley, Rte. 1, Box 123B, Zimmermann, Minn. 55398

Continuation of Ser. No. 824,259, Aug. 15, 1977, abandoned, which is a continuation of Ser. No. 668,326, Mar. 18, 1976, abandoned. This application Aug. 21, 1978, Ser. No. 935,605

Int. Cl.[2] C02C 5/04

U.S. Cl. 261—91 4 Claims



1. A water aerating device for bodies of water, such as lakes, ponds or the like, said device comprising floatation means located on the surface of the water and having an upper surface of predetermined diameter, a water inlet member for extending downwardly into the water to be aerated, and supported on said floatation means, said water inlet member having a water discharge opening which is bounded by said upper surface of said floatation means, a rotatable shaft mounted in said water inlet member and having a water pump impeller secured thereto, said impeller acting to pump water upwardly through said water inlet member and discharging it upwardly through said discharge opening, a rotatable water and air beater secured to said shaft and located above said discharge opening, said beater having air scoop means on its upper side and water paddles on its lower side and against which water is discharged from said opening by said impeller, a baffle of a diameter less than said predetermined diameter located above said beater and including a downwardly and inwardly facing annular flange which is located above said upper surface of said floatation means and extends downwardly around said beater to enclose the periphery of said beater, said baffle having at least one air inlet opening therethrough located above said beater and inwardly of said annular flange, said beater laterally directing a mixture of air and water forceably against said downwardly and inwardly facing flange for downward direction by said flange against said upper surface of said floatation means, a power source connected to said shaft and above said baffle, and means for rigidly securing said baffle, said power source, and said water intake member on said floatation means, whereby air and the water being discharged from the water inlet member are thoroughly mixed, directed against said baffle, then directed downwardly against said upper surface of said floatation means and from thence to the body of water.

4,193,952

EXTRUSION OF SOLID PROPELLANT INCLUDING AMMONIUM PERCHLORATE WHISKERS

Arnold Adicoff; William G. Finnegan; William R. McBride, all of China Lake, and William M. Ayres, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 4, 1972, Ser. No. 250,407

Int. Cl.[2] C06B 21/00, 45/10

U.S. Cl. 264—3 B 4 Claims

1. A method for preparing an improved propellant formulation comprises:

(1) introducing a viscous binder selected from the group consisting of linear carboxylated polybutadiene, polyurethane, polyvinylchloride and polybutadiene-acrylic acid copolymer into a mixing pot;

(2) adding while slowly agitating the pot ammonium perchlorate whiskers ranging in size from micron to below micron in diameter and having a length to diameter ratio of between 10:1 and 100:1 to form a mixture;

(3) casting said mixture;

(4) partially curing said mixture for a predetermined length of time at room temperature thereby increasing the viscosity thereof;

(5) extruding said viscous mixture into strands; and

(6) curing said strands in an oven at a predetermined temperature and for a predetermined length of time dependent upon the binder used.

4,193,953

HYDROSOL DROPLET CASTING PROCESS FOR PRODUCTION OF NUCLEAR FUEL AND BREEDER MATERIAL GRANULES

Hans Langen, Jülich; Helmut Ringel, Niederzier-Hambach, and Erich Zimmer, Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschrankter Haftung, Jülich, Fed. Rep. of Germany

Filed Jul. 19, 1978, Ser. No. 925,978

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1977, 2733384

Int. Cl.[2] G21C 21/00

U.S. Cl. 264—0.5 3 Claims

1. A method of producing breeder or fuel and breeder kernels for fuel elements of nuclear reactors comprising the steps of:

making a hydrosol containing a dispersed particle phase selected from the group consisting of thorium oxide and mixtures thorium oxide and uranium (VI) oxide which mixtures have a hexavalent uranium content not exceeding 25% by weight of the aggregate amount of heavy metal, and hydrosol having a heavy metal concentration between 1.5 and 3 moles per liter, and

injecting said hydrosol substantially horizontal in the form of drops into a gas phase enriched with ammonia gas overlying an ammonium hydroxide containing precipitation bath held at a pH value between 8 and 9, so that said drops fall by gravity through said gas phase while being affected by the ammonia content thereof and are immersed in said precipitation bath and hardened therein.

4,193,954

BETA ALUMINA MANUFACTURE

Barry K. Speronello, Saddle Brook, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Menlo Park, N.J.

Filed Mar. 27, 1978, Ser. No. 890,797

Int. Cl.[2] C04B 35/10

U.S. Cl. 264—13 17 Claims

1. A process for preparing a beta alumina article useful as a solid electrolyte which comprises (a) forming an aqueous substantially homogeneous slurry containing at least 40% solids on a weight basis and comprising powdered anhydrous alumina, sodium nitrate and sodium carbonate in predeter-

mined relative proportions selected to produce in step (c) pressed green bodies having maximum green density, and, optionally, a source of cations selected from the group consisting of magnesium, lithium and mixtures thereof, (b) drying said slurry sufficiently rapidly to precipitate said soluble components and form a uniform particulate mixture thereof with said powdered alumina, (c) compacting said particulate mixture under pressure without having previously calcined it to produce a green shaped article having a green density in the range of about 1.92 to 2.44 g./cc., (d) heat treating said article to decompose and react the constituents of said particulate mixture to form beta alumina and sintering the article to produce dense beta alumina.

4,193,955

METHOD OF PRODUCING AN ELECTRICALLY CONDUCTIVE PLASTICS MATERIAL

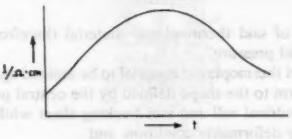
Ludwig Prölss, Bellach, Switzerland, assignor to Kilcher-Chemie AG, Recherswil, Switzerland

Filed Nov. 14, 1977, Ser. No. 851,177

Claims priority, application Switzerland, Dec. 3, 1976, 15245/76

Int. Cl.[2] B29B *31/80*

U.S. Cl. 264—23 **8 Claims**



1. A method of producing an electrically conductive plastic material, the conductive pigment in said material being selected from lamp black, graphite and a mixture of lamp black and graphite, comprising the steps of dispersing the conductive pigment in a hydrocarbon solvent, subjecting the pigment-hydrocarbon dispersion to a vibrational force with a frequency corresponding approximately to the frequency of resonance of the pigment-structure to cause swelling of the conductive pigment until the maximum of the volume is reached, and, at the time of maximum swelling, adding a bonding agent having an interfacial tension substantially equal to that of the solvent.

4,193,956

PROCESS FOR CURING THERMOSETTING RESINS AND ELASTOMERS

John Z. Kalnins, Seaford, Australia, assignor to McPheasons Limited, Melbourne, Australia

Continuation-in-part of Ser. No. 720,418, Sep. 3, 1978, abandoned. This application Jul. 19, 1978, Ser. No. 926,036

Claims priority, application Australia, Sep. 5, 1975, PC3052/75

Int. Cl.[2] B29G *7/00*

U.S. Cl. 264—27 **21 Claims**

1. A method of shaping and curing a friction or anti-friction material for use in brakes, clutches, bearings and the like comprising the steps of:

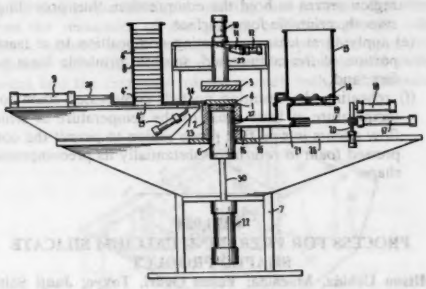
(a) introducing a mixture of a substantially non-electrically conducting heat bondable friction or anti-friction material composite with at least one divided electrically conductive material uniformly dispersed throughout the mixture into an insulated mold having a predetermined shape;

(b) closing the mold to confine said mixture;

(c) locating at least two electrodes on opposed sides of the mixture and electrically connected with the mixture;

(d) applying an electrical potential to said electrodes to pass an electric current substantially throughout said mixture to thereby effect resistance heating, shaping and curing of the mixture within the mold; and

(e) monitoring the energy input to said mixture to control the total energy input to a predetermined value required for effecting shaping and curing of the mixture within the



mold independently of electrical resistance variations of said mixture.

4,193,957

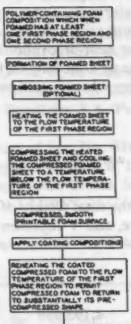
PROCESS FOR FORMING A SURFACE COVERING HAVING DECORATIVE EFFECTS

William J. Kauffman, Lancaster, and George L. Lilley, Manheim, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Continuation-in-part of Ser. No. 820,864, Aug. 1, 1977, abandoned. This application May 10, 1978, Ser. No. 904,611

Int. Cl.[2] B29D *27/04*

U.S. Cl. 264—46.4 **6 Claims**


POLYMER-CONTAINING FOAM COMPOSITION WHICH WHEN FOAMED HAS AT LEAST ONE FIRST PHASE REGION AND ONE SECOND PHASE REGION
FORMATION OF FOAMED SHEET
EMBOSSING FOAMED SHEET (OPTIONAL)
HEATING THE FOAMED SHEET TO THE FLOW TEMPERATURE OF THE FIRST PHASE REGION
COMPRESSING THE HEATED FOAMED SHEET AND COOLING THE COMPRESSED FOAMED SHEET TO A TEMPERATURE BELOW THE FLOW TEMPERATURE OF THE FIRST PHASE REGION
COMPRESSED, SMOOTH PRINTABLE FOAM SURFACE
APPLY COATING COMPOSITION
REHEATING THE COATED COMPRESSED FOAM TO THE FLOW TEMPERATURE OF THE FIRST PHASE REGION TO PERMIT COMPRESSED FOAM TO RETURN TO SUBSTANTIALLY ITS PRE-COMPRESSED SHAPE
PRODUCT

1. A process of forming a surface covering having decorative effects which process comprises:

(a) depositing a mechanically frothed foam or forming a chemically blown foam on a backing, said foam comprising at least one polymer or a blend of polymers, said polymer or blend of polymers having at least a first phase region and a second phase region, both phase regions existing at least in the surface region of said foam,

(1) flow occurring in said first phase region at a temperature above room temperature and said first phase region serving to hold the compressed shape of the foam in compression step (d) below.

(2) said second phase region remaining elastomeric at the temperature at which said first phase region flows;

(b) curing or fusing the foam on the backing;

(c) compressing the resulting cured or fused foam, at a temperature sufficient to cause flow to occur in said first phase region, in order to form a smooth, printable foam surface and cooling the foam in the compressed shape to a

temperature below the temperature at which flow occurs in said first phase region;

(d) removing the compressing force whereby the first phase region serves to hold the compression, thus providing a smooth, printable foam surface;

(e) applying at least one coating composition to at least a portion of the compressed, smooth, printable foam surface; and,

(f) reheating the resulting coated, compressed foam to a temperature at least equal to the temperature at which flow occurs in said first phase region to permit the compressed foam to return to substantially its precompressed shape.

4,193,958

PROCESS FOR PREPARING CALCIUM SILICATE SHAPED PRODUCT

Mitsuo Uchida, Machida; Yasuo Oguri, Tokyo; Junji Saito, Machida, and Tsukasa Kawahara, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed Nov. 7, 1977, Ser. No. 849,468

Claims priority, application Japan, Nov. 18, 1976, 51/138721; Nov. 22, 1976, 51/140439; Dec. 14, 1976, 51/150066; May 31, 1977, 52/63621

Int. Cl.[2] B28B *1/26*

U.S. Cl. 264—86 **11 Claims**

1. A process for preparing a calcium silicate shaped product, of bulk density lower than 0.13 g/cm^3 and bending strength of 4.3–8 kg/cm^2 which comprises:

forming an aqueous slurry of calcium silicate hydrate of tobermorite group compounds having a wet volume of more than 15 cm^3/g by heating at a temperature higher than 130° C. a siliceous source and a calcareous source dispersed in water to react them;

shaping the aqueous slurry with a press filter molding;

curing said filtered slurry by a steam curing under pressure while transforming said calcium silicate hydrate from semi-crystalline or near-amorphous tobermorite to crystalline tobermorite or xonotlite; or from crystalline tobermorite to xonotlite; wherein said wet volume is given by the equation:

$$\text{wet volume} = \frac{V}{W}$$

wherein W represents the total weight of the calcareous source and the siliceous source, and V represents the volume of solid components after a 24 hour sedimentation of said aqueous slurry.

4,193,959

PRESSURE FORMING METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 813,804, Mar. 27, 1969, abandoned, which is a continuation-in-part of Ser. No. 501,174, Oct. 22, 1965, abandoned, which is a continuation-in-part of Ser. No. 393,292, Aug. 31, 1964, abandoned, which is a continuation-in-part of Ser. No. 559,232, Jan. 16, 1956, Pat. No. 3,401,418. This application Aug. 10, 1971, Ser. No. 170,625

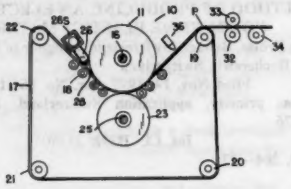
Int. Cl.[2] B29D *7/02*

U.S. Cl. 264—166 **6 Claims**

1. A method of forming sheet material comprising:

providing an elongated bucking sheet having a central portion and longitudinal border portions and feeding said bucking sheet against a cylindrical roll having a central portion of reduced diameter disposed a distance away from the central portion of said bucking sheet and having cylindrical end portions of greater diameter than said roll central portion with said cylindrical end portions compressively engaging the respective longitudinal border portions of said bucking sheet and sealingly engaged to said bucking sheet, rotating said cylindrical roll while feeding and maintaining said bucking sheet against the cylindrical end portions of the roll as the roll rotates and maintaining the border portions of said bucking sheet sealed to and in surface engagement with said end portions of said cylindrical roll so as to define an arcuate clearance volume between the central portion of the surface of said bucking sheet and the surface of the central portion of said cylindrical roll,

feeding a thermoplastic material into the arcuate clearance volume defined by said bucking sheet and the central portion of said cylindrical roll and providing said thermoplastic material in said clearance volume under pressure and in a thermally deformable condition, and maintaining sealing engagement between said bucking sheet against the end portion of said cylindrical roll to prevent the



outflow of said thermoplastic material therefrom while under said pressure,

causing said thermoplastic material to be molded against and to conform to the shape defined by the central portion of said cylindrical roll and said bucking sheet while in said thermally deformable condition, and

conveying said thermoplastic material partly around said cylindrical roll in the arcuate path defined by said arcuate clearance volume while reducing the temperature of said thermoplastic material as it is conveyed around said roll to cause it to set to substantially the shape defined by the central portion of said roll and said bucking sheet, and

removing said bucking sheet and the material solidified thereagainst from said clearance volume.

4,193,960

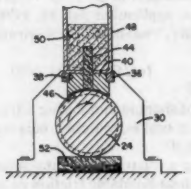
METHOD OF FORMING A BEARING CONTACTOR

Martin L. Abel, Franklin, Mich., assignor to Permawick Company, Inc., Detroit, Mich.

Division of Ser. No. 618,337, Oct. 1, 1975. This application Dec. 2, 1977, Ser. No. 857,037

Int. Cl.[2] D04H *1/64*

U.S. Cl. 264—128 **2 Claims**



1. A method for forming a contactor adapted to transmit oil to a bearing surface from a reservoir of oil-impregnated wicking material having interstices therein, comprising:

(a) filling a mold cavity of a predetermined size and shape with a charge of a fibrous material;

(b) compressing the fibrous material in said mold cavity to a density wherein the fibrous material has therein a network of interconnected pores of a size smaller than the interstices in the wicking material;

(c) relieving the compressing force, while the compressed

fibrous material retains said network of interconnected pores smaller than the interstices in the wicking material;

(d) saturating the prior compressed fibrous material with an alcohol-nylon solution;

(e) allowing the alcohol to evaporate whereby many of the individual fibers absorb the nylon and become coated with the nylon, thereby forming a contactor consisting of a dry mass of bonded fibers containing a network of interconnected pores of a size smaller than the interstices in the wicking material; and,

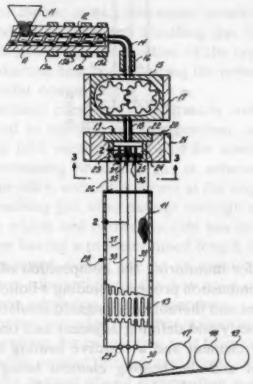
(f) removing the contactor from the mold.

4,193,961

METHOD OF EXTRUDING POLYPROPYLENE YARN

John S. Roberts, Ellicott, Md., assignor to Kling-Tecs, Inc., Mantoloking, N.J.

Filed Apr. 4, 1978, Ser. No. 893,371
Int. Cl.[2] D01D 5/22
U.S. Cl. 264—176 F **13 Claims**



1. A method of producing a multifilament polypropylene yarn comprising heating polypropylene having a narrow molecular weight distribution with a swell value of less than 3 to a temperature at which it is molten, extruding the molten polypropylene at a temperature less than 425° F. into a plurality of filaments, passing the filaments through a first zone having a temperature sufficiently high to retard cooling of the filaments therein, drawing down the filaments to their undrawn denier in said first zone, then passing the filaments through a second zone, and directing cooling gas over the filaments in said second zone to cool them, the combination of the swell value of the polypropylene, the temperature of extrusion, and the temperature of said first zone interacting to substantially eliminate the occurance of resonance in the filaments as they are drawn down in said first zone.

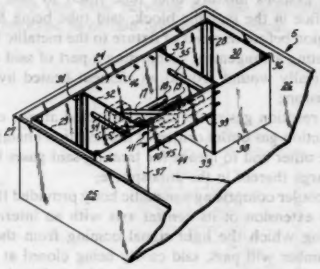
4,193,962

MELT SPINNING PROCESS

John S. Roberts, Ellicott City, Md., assignor to Kling-Tecs, Inc., Mantoloking, N.J.

Filed Aug. 11, 1978, Ser. No. 932,832
Int. Cl.[2] D01D 5/08
U.S. Cl. 264—178 F **6 Claims**

1. A method of producing a multifilament yarn from thermoplastic material by liquid quench melt spinning in which the filaments are extruded in molten state downwards into a quench bath containing quench liquid in which they are quenched and solidified, and in which the solidified filaments pass around guide means before being withdrawn upwardly out of said quench bath, whereby the molten filaments first enter a partitioned portion of the quench bath, the quench liquid in said partitioned portion being separated from the quench liquid in the remainder of the quench bath and only being in communication therewith through inlet means and outlet means, quench liquid entering said partitioned portion from the remainder of the quench bath through said inlet means, quench liquid exiting from said partitioned portion together with said solidified filaments through said outlet means into the remainder of the quench bath, said filaments



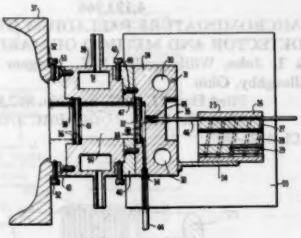
passing around said guide means before so exiting, the movement of the filaments through said partitioned portion generating a pumping action of the quench liquid therethrough, and said pumping action being caused to be inefficient by the area of said inlet means being greater than the area of said outlet means with a substantial reduction of vortexing where the filaments first enter the quench liquid.

4,193,963

APPARATUS FOR THE DETERMINATION OF CHEMICAL COMPOUNDS BY CHEMILUMINESCENCE WITH OZONE

Wilhelm Bruening; Iniäi M. R. de Andrade Bruening, and Francisco J. Martinez Concha, all of Rio de Janeiro, Brazil, assignors to Petroleo Brasileiro S.A.-Petrobras, Rio de Janeiro, Brazil

Continuation-in-part of Ser. No. 614,981, Sep. 19, 1975, abandoned. This application Jun. 6, 1977, Ser. No. 803,916
Claims priority, application Brazil, Sep. 20, 1974, 007833
Int. Cl.[2] G01N 21/24, 33/00
U.S. Cl. 422—52 **4 Claims**



1. An apparatus for the qualitative and quantitative measurement of specific hydrocarbons contained in a mixture and capable of reacting with ozone to emit chemiluminescence, said apparatus comprising:

(a) a reaction chamber essentially comprising a cavity formed in an otherwise smooth phase of a metallic block, said cavity being closed by means of a quartz window fitted to said smooth phase to said metallic block, said block being formed with three orifices connecting the outside with the inside of the reaction chamber, one of said orifices being adapted for the admission to the inside of said chamber of the gaseous flow to be analyzed, an-

other of said orifices being adapted to transmit the admission of ozone to the inside of said chamber and the third orifice being adapted for the discharge of the gases formed after the reaction with ozone;

(b) heating resistors inserted in said metallic block for maintaining said reaction chamber at a temperature selected between 20° and 250° C.;

(c) a gaseous mixture inlet tube fitted to said respective orifice in the metallic block, said tube being heated in a region before its point of fixture to the metallic block, said heating arrangement comprising a part of said tube being helically wound around an element heated by electrical resistors;

(d) a reaction gas outlet tube connected at one end to said reaction gas outlet orifice of the reaction chamber, and at the other end to means for treating said gases before discharge thereof in the atmosphere;

(e) a cooler comprising a metallic body provided throughout the extension of its central axis with an internal cavity, along which the light signal coming from the reaction chamber will pass, said cavity being closed at one of its ends by said quartz window of said reaction chamber and at its other end by a second quartz window, the walls of said metal body being provided with channels for the circulation of cooling liquid;

(f) means for detecting said chemiluminescence and providing a signal related to the intensity of said chemiluminescence, comprising an optical system adjacent said second quartz window, and a photomultiplier adjacent said optical system, the internal cavity of said cooler, said quartz window in said reaction chamber, said optical system and said photomultiplier being optically aligned with each other; and

(g) electronic amplifier, converter and recorder means for said signal connected to said photomultiplier.

4,193,964

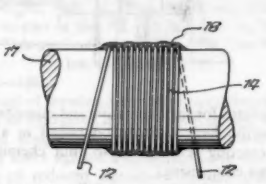
MICROMINIATURE PALLADIUM OXIDE GAS DETECTOR AND METHOD OF MAKING SAME

Frank T. John, Williamsville, N.Y., assignor to A-T-O Inc., Willoughby, Ohio

Filed Dec. 21, 1977, Ser. No. 862,974

Int. Cl.² G01N *27/04*; H01C *3/00*

U.S. Cl. 422—90 **46 Claims**



1. An element which, at a temperature of below about 600° C., undergoes a change in electrical resistance when exposed to a combustible gas in air, said element comprising a wire coated with a solution of a palladium compound which is heated to from about 100° C. to about 600° C. to form a palladium oxide composition.

4,193,965

CIRCUIT ASSEMBLY FOR EXHAUST EMISSION MONITORING

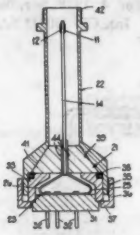
Christopher V. Cullingford, Inkberrow, and Martin A. Read, Redditch, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Apr. 3, 1978, Ser. No. 892,598

Claims priority, application United Kingdom, Apr. 12, 1977, 15101/77

Int. Cl.² G01N *27/04, 27/26*; H01C *7/00*

U.S. Cl. 422—95 **8 Claims**

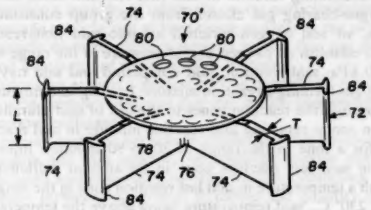


1. A device for monitoring the composition of the exhaust emission of a combustion process including a hollow elongated body open at one end thereof, an elongated insulating substrate located in the body and defining adjacent said one end of the body a sensing element and a resistive heating element, the sensing element and the heating element being printed on opposite sides respectively of the substrate adjacent one end of the substrate and being electrically connected to respective first conductive areas extending to the opposite end of the substrate, said sensing element having electrical characteristics which vary with the concentration of oxidising or reducing constituents in the exhaust emission being sensed when the sensing element is raised to an elevated operating temperature by said heating element, first and second, elongated flexible circuit elements each having an elongated second conductive area provided on one surface of the respective element and extending from one end of the element, a carrier mounted in the other end of the hollow body, said one end of each of said first and second circuit elements being secured to the carrier with the opposite ends of the elements projecting from the carrier and being folded inwardly so that said second conductive areas are presented to each other, at least two terminal members supported by the carrier and electrically connected to said second conductive areas respectively, the other end of the substrate being interposed between the folded portions of the first and second circuit elements so that said second conductive areas are aligned with said first conductive areas respectively, a locating sleeve engaged with said carrier so that said substrate and said folded portions of the first and second circuit elements extend through the sleeve, at least one clamping member movable into a channel defined in the sleeve and engaging at least one of the folded portions of said first and second circuit elements, and means urging said clamping member to trap said folded portions against the substrate whereby said first and second conductive areas are urged into electrical contact with each other to electrically connect said terminal members so said sensing element and said resistive element respectively.

4,193,966
CARBON DIOXIDE ABSORBENT CANNISTER WITH CONDENSATE CONTROL

Ronald W. Dowgul, Panama City Beach, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 15, 1978, Ser. No. 915,635
Int. Cl.[2] B01J 7/02; A61M 15/00
U.S. Cl. 422—122 **8 Claims**



1. A canister for use in an underwater breathing apparatus of the rebreather or recirculated breathing gas type and containing a bed of absorbing composition of the type characterized by an exothermic reaction requiring the presence of moisture, said cannister comprising:

a hollow container comprising a thermally conductive wall and adapted to contain said composition, said container comprising inlet means at one end for admitting carbon dioxide containing breathing gas at substantially 100% relative humidity, and outlet means at the opposite end for exiting breathing gas, after passage through said composition, from which said carbon dioxide has been removed;

said container having a predetermined length and including portions exposed during use to an ambient medium at temperatures substantially at the dew point of said breathing gas upon admission to said container;

condenser means, mounted in said container in contact with said composition, for conducting heat from said gas admission and while passing through said composition, whereby the moisture content of said composition is maintained so as to support said reaction through an extended period;

said condenser means comprising at least a first condenser element comprising a plurality of leg portions formed of a thermally conductive material and extending from a common origin within said container, each of said leg portions having an outer end in thermally conducting contact with the inner surface of said wall of said container, a heat sink and diffuser disc comprising a thermally conductive material and fixed to said leg portions, said disc lying generally transversely of the principal direction of flow through the cannister and defining a space between the outer edge of the disc and said wall, and said condenser element having a length in said principal direction of flow that is in the range of from about one-tenth to about two-tenths of said predetermined length of said cannister.

4,193,967
LIQUID SEALING APPARATUS FOR SEALING VAPORS IN A TANK

James L. Black, Houston, Tex., assignor to Merichem Company, Houston, Tex.

Filed Oct. 16, 1978, Ser. No. 951,541
Int. Cl.[2] B01D 47/02, 47/06; F16L 43/00
U.S. Cl. 422—170 **8 Claims**

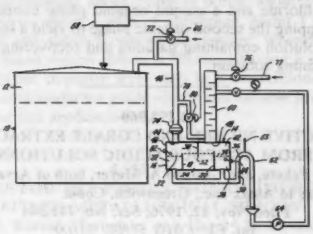
1. A liquid sealing apparatus for attachment to a tank having vapor therein for sealing the vapors comprising,

an enclosure,

first and second liquid partitions positioned in the enclosure extending upwardly from the bottom of the enclosure toward but not to the top of the enclosure dividing the enclosure into first, second and third liquid compartments for receiving a sealing liquid,

a liquid trap connected to the first and third liquid compartments for maintaining liquid therein and preventing escape of gas,

a third partition positioned in the enclosure extending downwardly from the top of the enclosure into the second liquid compartment dividing the enclosure into first and second gas compartments above the fluid compartments whereby gas can flow between said gas compartments only in response to certain pressure differences,



a first port in the first gas compartment adapted for connection to said tank having vapor,

a second port connected to the second gas compartment for admission and exit of gas from the second gas compartment,

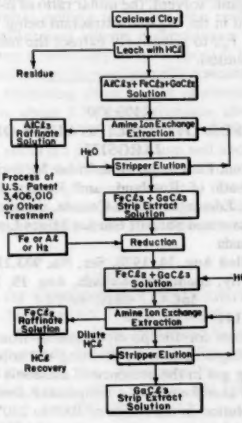
a gas scrubber connected to the second port for scrubbing vapor flowing into the first port and into the second gas compartment, and supplying sealing liquid through the second port to the second fluid compartment, and

a liquid connection between the liquid trap and the gas scrubber for recycling scrubbing liquid.

4,193,968
PROCESS FOR RECOVERING GALLIUM

Robert E. Sullivan, Louisville, Ky.; William R. Stern, and Bess L. Vance, both of Tucson, Ariz., assignors to The Anaconda Company, Denver, Colo.

Filed Oct. 3, 1978, Ser. No. 948,296
Int. Cl.[2] C01G 15/00; C01F 7/00; C01G 49/00
U.S. Cl. 423—112 **4 Claims**



1. A process for recovering gallium from calcined clay which comprises leaching calcined clay with a hydrochloric

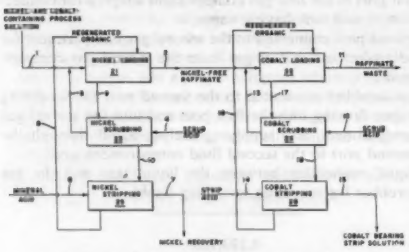
acid solution, separating the hydrochloric acid solution from residuals, treating the hydrochloric acid solution containing aluminum chloride, ferric chloride, and gallium chloride in an organic-containing amine ion extraction unit for separately recovering aluminum chloride raffinate solution and an organic phase containing ferric chloride and gallium chloride, stripping the organic phase to yield a first strip extract solution containing ferric chloride and gallium chloride, reducing the ferric chloride in such solution to ferrous chloride and incorporating sufficient hydrochloric acid in the reduced solution to convert the gallium therein to $GaCl_4^-$ ions, then treating said solution in a second organic-containing amine ion extraction unit for separately recovering a raffinate solution containing ferrous chloride and a second organic phase containing gallium, stripping the second organic phase to yield a second strip extract solution containing gallium, and recovering the gallium-containing solution.

4,193,969

SELECTIVE NICKEL AND COBALT EXTRACTION FROM AQUEOUS ACIDIC SOLUTIONS

Simon O. Fekete, and Gustavo A. Meyer, both of Arvada, Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Nov. 12, 1976, Ser. No. 741,344
Int. Cl.[2] C01G *51/00, 53/00*
U.S. Cl. 423—139 **26 Claims**



1. A process for recovering at least one metal value selected from the group consisting of nickel or cobalt from an aqueous process solution having a pH value less than about 4 and containing other metal ions which comprises contacting the process solution with a liquid organic extractant containing an α-hydroxyoxime and a sulfonic acid dissolved in a water-immiscible organic solvent, the molar ratio of α-hydroxyoxime to sulfonic acid in the organic extractant being between about 4:1 and about 1:2, to selectively extract the metal value from the process solution.

4,193,970

PROCESS FOR THE PRECIPITATION OF IRON AS JAROSITE

Verner B. Sefton, Edmonton; Godefridus M. Swinkels; Charles R. Kirby, both of Rossland, and Roman M. Genik-Sas-Berezowsky, Edmonton, all of Canada, assignors to Cominco Ltd., Vancouver and Sherritt Gordon Mines Limited, Toronto, both of, Canada

Filed Aug. 14, 1978, Ser. No. 933,215
Claims priority, application Canada, Aug. 19, 1977, 285090
Int. Cl.[2] C01G *49/14*
U.S. Cl. 423—141 **3 Claims**

1. In a process for the precipitation of iron from ferrous sulfate-containing solutions by reacting the solutions with an oxygen-bearing gas in the presence of ammonia or ammonium or alkali-metal compounds at a temprature above the boiling point of the solution in the range of 100° to 230° C. and under super-atmospheric pressure of an oxygen-bearing gas for precipitation of jarosite and production of sulfuric acid, the improvement which comprises the steps of preheating ferrous sulfate-containing solution to a temperature in the range of 70° to 130° C., said temperature being below the temperature at which ferrous sulfate may precipitate from said solution; feeding preheated ferrous sulfate-containing solution comprising iron in an amount in the range of 20 to 100 g/L iron as ferrous sulfate and an amount of sulfuric acid of up to 50 g/L to the first of a plurality of reaction zones; maintaining a temperature in said first reaction zone of at least 100° C.; feeding a compound chosen from the group consisting of ammonia, ammonium compounds and alkali-metal compounds to said ferrous sulfate-containing solution in said first reaction zone; feeding an oxygen-bearing gas chosen from the group consisting of oxygen, air and oxygen-enriched air into said first reaction zone to establish an oxygen partial pressure in the range of 50 to 1400 kPa; said solution, said compound and said oxygen-bearing gas forming a reaction mixture; causing said mixture to flow through the reaction zones to the last of said plurality of reaction zones; retaining said reaction mixture in said reaction zones for a time in the range of 20 to 90 minutes; injecting steam in said last reaction zone in an amount sufficient to establish a temperature in said last reaction zone in the range of 170° to 230° C., said temperature being above the temperature in said first reaction zone; and discharging the reaction mixture, wherein the reaction mixture discharged from said last reaction zone contains iron in an amount in the range of 2 to 15 g/L iron and sulfuric acid in the range of 40 to 60 g/L, from said last reaction zone.

4,193,971

PROCESS FOR REMOVAL OF SULFUR OXIDES FROM WASTE GASES

Naoyuki Kawamata, Kobe; Tadahara Itoh, Ashiya, and Noriaki Takahashi, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Nov. 8, 1977, Ser. No. 850,623
Claims priority, application Japan, Mar. 23, 1977, 52-32605
Int. Cl.[2] C01B *17/00;* **C01F** *1/00, 11/46*
U.S. Cl. 423—242 **10 Claims**

1. A process for removal of sulfur oxides from waste gases, which comprises the steps, in combination, of:

A. contacting an aqueous slurry containing magnesium hydroxide as well as gypsum with a waste gas containing sulfur oxides thereby fixing the sulfur oxides as magnesium sulfite;

B. contacting the aqueous slurry containing the magnesium sulfite as well as the gypsum with an oxidizing agent thereby converting the magnesium sulfite into magnesium sulfate;

C. subjecting the aqueous slurry containing magnesium sulfate as well as gypsum to filtration thereby obtaining an aqueous solution of the magnesium sulfate and a cake of gypsum;

D. causing the magnesium sulfate in the aqueous solution to undergo double decomposition with calcium hydroxide with the addition of a quantity of gypsum crystals as seed crystals thereby obtaining a slurry of magnesium hydroxide and gypsum, which slurry is to be recycled to step A;

wherein the mole ratio of $MgSO_4/Ca(OH)_2$ in step D is controlled so as to be equal to or higher than 1.0 whereby the resulting slurry is substantially free of calcium hydroxide when it is recycled to step A.

4,193,972

TREATING PARTICLE-CONTAINING SOX OR NOX GAS STREAMS IN PARALLEL PASSAGE CONTACTORS

Jack B. Pohlenz, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 2, 1977, Ser. No. 847,968
Int. Cl.[2] C01B *17/00;* **B01J** *8/00;* **C01B** *21/00*
U.S. Cl. 423—244 **3 Claims**

1. In a method of removing noxious gaseous atmospheric pollutants selected from the group consisting of sulfur oxides and nitrogen oxides from a flue gas stream of a coal-fired

combustion zone wherein said flue gas is passed through (i) a particle removal zone wherein particulate particles are removed from said flue gas stream; and (ii) a stationary parallel passage contacting zone wherein said noxious pollutants within said flue gas stream are substantially reduced to produce a flue gas stream containing a decreased quantity of said noxious pollutants; the improvement which comprises:

(1) classifying by size said particulate particles removed from said flue gas stream in said particle removal zone to produce a quantity of relatively coarse particles having an average particle size at least twice as great as the average particle diameter of said particles in said flue gas stream and a quantity of relatively fine particles;

(2) admixing at least a portion of said quantity of relatively coarse particles into said flue gas stream containing said noxious pollutants;

(3) passing said flue gas stream containing said noxious pollutants and said quantity of relatively coarse particles through said stationary parallel passage contacting zone under turbulent conditions to reduce the quantity of deposited fine particulate material from the outer surface of said stationary parallel passage contactor; and

(4) passing said flue gas stream containing said quantity of relatively coarse particles to said particle removal zone to remove at least a portion of said quantity of relatively coarse particles from said flue gas before emission of said flue gas containing a reduced quantity of said noxious pollutants to the atmosphere.

4,193,973
PROCESS FOR STABILIZATION OF DICALCIUM PHOSPHATE

William M. Jarvis, Webster Groves, and Keun Y. Kim, Clayton, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1978, Ser. No. 972,566
Int. Cl.[2] C01B *25/32*
U.S. Cl. 423—265 **4 Claims**

1. In a process for the preparation of stabilized dicalcium phosphate dihydrate wherein an aqueous mixture containing dicalcium phosphate dihydrate is treated with a tetra-alkali metal pyrophosphate, the improvement which comprises

(a) adding a stabilizing amount of the tetra-alkali metal pyrophosphate to said aqueous mixture at a pH from about 5.5 to about 6.5 for said mixture; and then

(b) adding to the mixture resulting from Step (a) a material selected from the group consisting of alkali metal, alkaline earth metal and ammonium hydroxides in an amount which results in a stabilized dicalcium phosphate dihydrate having a pH from about 6.5 to about 8.0.

4,193,974
PROCESS FOR PRODUCING REFINED METALLURGICAL SILICON RIBBON

Peshotan S. Kotval, Hartsdale, and Harold B. Strock, North Tarrytown, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,763
Int. Cl.[2] C01B *33/02*
U.S. Cl. 423—348 **15 Claims**

1. A process for the production of low-cost, multigrained refined metallurgical silicon ribbon from metallurgical grade silicon comprising:

a. dissolving metallurgical grade silicon in a liquid metal solvent to form a metal solvent-silicon solution;

b. cooling said solution to a temperature at which silicon platelets form;

c. removing silicon platelets from said solution of metallurgical grade silicon in a liquid metal solvent, thereby recovering partially purified, essentially iron-free silicon platelets with adherent impurities derived from said metal solvent;

d. melting said partially purified silicon platelets in contact with acid silica slag in a melting zone, the resulting slag oxidation removing residual and said adherent impurities from the silicon platelets;

e. removing the silicon-slag melt from said melting zone in a unidirectional manner so as to directionally solidify said silicon; and

f. pulling a silicon ribbon from a melt of the thus-refined silicon, the resulting refined metallurgical silicon ribbon comprising a multigrained silicon ribbon having a resistivity of from about 0.04 to about 0.2 ohm-cm, said silicon having impurity concentrations of up to, but not exceeding, about 1 ppm of aluminum, about 1 ppm of iron, about 2 ppm of titanium, about 2 ppm of boron, about 2 ppm of phosphorus, about 1 ppm of chromium, about 1 ppm of calcium and about 1 ppm of magnesium, whereby said, multigrained silicon ribbon is obtained having a substantially higher impurity level than in a conventional, high purity semiconductor grade silicon and suitable properties for solar cell applications.

4,193,975
PROCESS FOR THE PRODUCTION OF IMPROVED REFINED METALLURGICAL SILICON

Peshotan S. Kotval, Hartsdale, and Harold B. Strock, North Tarrytown, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,759
Int. Cl.[2] B01J *17/20*; C01B *33/02*
U.S. Cl. 423—348 **24 Claims**

1. A process for the production of low-cost multigrained refined metallurgical silicon from metallurgical grade silicon comprising:

a. dissolving metallurgical grade silicon in a liquid metal solvent to form a metal solvent-silicon solution;

b. cooling said solution to a temperature at which silicon platelets form;

c. removing said silicon platelets from said solution of metallurgical grade silicon in a liquid metal solvent, thereby recovering partially purified, essentially iron-free silicon platelets with adherent impurities derived from said metal solvent;

d. melting said partially purified silicon platelets in contact with acid silica slag in a melting zone, the resulting slag oxidation removing residual and adherent impurities from said silicon; and

e. pulling refined metallurgical silicon boules from a melt of the thus-refined silicon on a rotating silicon seed rod by the Czochralski pulling technique, the resulting pulled, refined metallurgical silicon comprising a multigrained silicon having a resistivity of from about 0.1 to about 0.2 ohm-cm, said silicon having impurity concentrations of up to, but not exceeding about 1 ppm of aluminum, about 1 ppm of iron, about 0.5 ppm of titanium, about 2 ppm of boron, about 2 ppm of phosphorus, about 0.5 ppm of chromium, about 0.5 ppm of calcium and about 0.5 ppm of magnesium, whereby said multigrained silicon is obtained at a substantially higher impurity level than in a conventional high purity semiconductor grade silicon and has suitable properties for solar cell applications.

4,193,976
REMOVAL OF DINITROGEN DIFLUORIDE FROM NITROGEN TRIFLUORIDE

John T. Lileck, Tamaqua; John Papinsick, Summit Hill, and Edward J. Steigerwalt, Lehighton, all of Pa., assignors to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Apr. 6, 1978, Ser. No. 894,114
Int. Cl.[2] C01B *21/52*
U.S. Cl. 423—406 **8 Claims**

1. A process for purifying a nitrogen trifluoride containing atmosphere contaminated with dinitrogen difluoride in an amount not exceeding about 5% by volume which comprises selectively decomposing said dinitrogen difluoride while

avoiding decomposition of said nitrogen trifluoride, said selective defluorination comprising the steps:

contacting the atmosphere with a particulate elemental metal which is inert to nitrogen trifluoride to the extent that not more than 3.5 grams nitrogen trifluoride will react with 100 grams of particulate elemental metal spheres of ¼ inch in diameter when at a temperature of 500° F., and atmospheric pressure in a 100 second time period, said contacting being for a time and at a temperature effective for permitting selective defluorination.

4,193,977

PROCESS FOR PREPARING FOAMABLE SODIUM PERCARBONATE

Yunosuke Nakagawa, Soka, and Minoru Kikuchi, Tokyo, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1978, Ser. No. 941,210

Claims priority, application Japan, Sep. 13, 1977, 52-111001

Int. Cl.[2] C01B *15/10*

U.S. Cl. 423—415 P **2 Claims**

1. A process for preparing dry particles of foamable sodium percarbonate which consists essentially of the steps of: (1) flowing a stream of hot air through a bed of sodium percarbonate particles to heat said particles to a temperature of from 110° to 135° C. and maintaining said particles at said temperature for from 5 to 60 minutes, and (2) then immediately thereafter flowing a stream of cool gas through a bed of the heated sodium percarbonate particles obtained in step (1) and thereby forcibly cooling said particles to a temperature below 90° C. within 10 minutes after completion of the heating step (1), whereby to obtain sodium percarbonate particles which foam vigorously in water and contain a high amount of available oxygen.

4,193,978

PRODUCTION OF HYDROGEN

Alain Muller, Le Havre; François Mathey, Vert le Petit, and Jean Bensoam, Ballancourt, all of France, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed Jun. 27, 1977, Ser. No. 810,616

Claims priority, application France, Jun. 28, 1976, 76 19584; Dec. 15, 1976, 76 37793

Int. Cl.[2] C01B *1/03*

U.S. Cl. 423—648 R **14 Claims**

1. In a combined process for the storage and generation of hydrogen from a hydrogen reserve comprising lithium borotetrahydride by decomposition of at least part of said borotetrahydride into hydrogen and a composition comprising boron in free or combined form and lithium in free or combined form, the improvement in said process for reusable hydrogen storage comprising driving the decomposition of the lithium borotetrahydride to generate more than one mole of free hydrogen per mole of lithium borotetrahydride and thereafter hydrogenating the composition comprising boron and lithium obtained upon the generation of hydrogen so as to reconstitute the hydrogen reserve at least partially, and thereafter generating more than one mole of free hydrogen per mole of lithium borotetrahydride from the reconstituted hydrogen reserve.

4,193,979

SODIUM 3-[[[2-(2-METHYL-5 NITRO-1H-IMIDAZOl-1-yL)ETHYL]-AMINO]CARBONYL]-2-PYRIDINECARBOXYLIC ACID AND RELATED COMPOUNDS LABELED WITH TECHNETIUM-99M

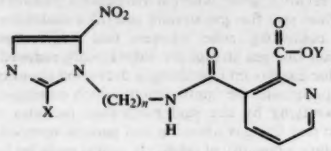
Patricia Frank, Evanston; Stephen Kraychy, Northbrook, and Ernest F. LeVon, Evanston, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed May 22, 1978, Ser. No. 907,645

Int. Cl.[2] C07D *401/12;* A61K *43/00*

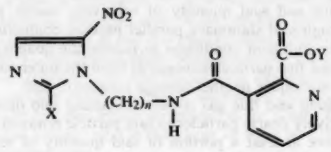
U.S. Cl. 424—1.5 **15 Claims**

1. A compound of the formula



wherein X can be an alkyl having 1 to 4 carbon atoms; Y is hydrogen or the cation of a pharmaceutically acceptable salt and n is a positive integer from 2 to 4.

2. A chelate of technetium-99m and a compound of the formula



wherein X can be an alkyl having 1 to 4 carbon atoms; Y is hydrogen or the cation of a pharmaceutically acceptable salt; and n is a positive integer from 2 to 4.

4,193,980

DRY PREPARATION FOR RETICULOCYTE STAINING

Stanley E. Clason, Painted Post, and John W. Gilliland, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 5, 1978, Ser. No. 867,199

Int. Cl.[2] G01N *33/16, 31/22, 21/60*

U.S. Cl. 424—3 **11 Claims**

8. A method of forming a stain tube containing an amount of dry stain sufficient for staining a volume V_b of blood, said method comprising

preparing a volume V_d of a concentrated aqueous solution of new methylene blue N dye,

filtering said dye solution,

preparing a concentrated aqueous solution of a salt of a strong base and a weak acid of a monovalent anion,

mixing said dye solution and said salt solution,

adding an anticoagulant to said mixture to form a stain stock solution,

dispensing into a tube a volume V_t of said stain stock solution which is sufficient to stain said volume V_b of blood, and

drying the stain stock solution in said tube, said dye and said salt being present in said tube in relative amounts which are effective, when the resultant dry stain is diluted in a volume V_b of pure deionized water, to form a solution, the pH of which is between 5 and 9.

4,193,981

PROCESS FOR QUANTITATIVE DETERMINATION OF CAPA ANTIGEN OR ANTIBODY

Tom B. Björklund, Bromma, Sweden, assignor to AB Bonnierföretagen, Sweden

Filed Sep. 28, 1977, Ser. No. 837,082

Claims priority, application Sweden, Oct. 1, 1976, 7610939

Int. Cl.[2] G01N *31/00, 31/02, 33/16*

U.S. Cl. 424—12 **6 Claims**

1. In a process for quantitative determination of the amount of CAPA, cancer associated polypeptide antigen, in a solution while using agglutination inhibition technique, comprising preparing under serial dilution a series of samples of said solution, adding to each of said samples a predetermined amount of antiserum containing antibodies specific with regard to the CAPA, adding after incubation to each of the resulting sam-

ples a predetermined amount of the said antigen carried by a particulate carrier resulting in agglutination, and preparing a corresponding series of control samples with known decreasing amounts of said antigen, the steps of

(1) measuring the diameter of the agglutination deposits of the control samples and

(2) plotting the measured diameters against the antigen concentrations, thereby obtaining an S-shaped curve, the middle part of which has a steep inclination,

(3) selecting a sample in said series of samples of unknown antigen concentration having a known diameter lying within said middle part of the curve,

(4) comparing said known diameter of the unknown sample with the diameters of samples of known concentration as plotted against known diameter in step (2), and

(5) reading off the CAPA concentration corresponding to the known diameter of said unknown sample.

6. In a process for quantitative determination of the amount of CAPA, cancer associated polypeptide antigen, antibody in solution while using agglutination technique, comprising preparing under serial dilution a series of samples of said solution, adding to each of said samples a predetermined amount of CAPA reacting specifically with said antibody and carried by a particulate carrier resulting in agglutination, and preparing a corresponding series of control samples with known decreasing amounts of said antigen, the steps of (1) measuring the diameter of the agglutination deposits of the control samples and (2) plotting the measured diameters as a function of the antibody concentrations, thereby obtaining a curve of reversed S-shape, the middle part of which has a steep inclination, (3) selecting a sample in said series of samples of unknown antibody concentration having a known diameter lying within said middle part of the curve, (4) comparing said known diameter of the unknown sample with the diameters of samples of known concentration as plotted against known diameter in step (2), and (5) reading off the antibody concentration corresponding to the known diameter of said unknown sample.

4,193,982

PROCESS FOR COUPLING BIOLOGICAL SUBSTANCES BY COVALENT BONDS

Stratis Avrameas, La Celle Saint Cloud, and Therese M. F. Ternynck, Paris, both of France, assignors to Etablissement DéClaré d'Utilité Publique dit: Institut Pasteur, Paris, France

Filed Dec. 1, 1976, Ser. No. 746,552

Claims priority, application France, Dec. 5, 1975, 75 37392

Int. Cl.[2] **A61K** *37/00, 39/00;* **C07G** *7/00;* **G01N** *31/00*

U.S. Cl. 424—12 **13 Claims**

1. In a process for coupling at least two biological substances by covalent bonds by means of a cross-linking agent, the said cross-linking agent being benzoquinone, the improvement comprising the steps of:

(a) treatment of Fab fragment of an immunoglobulin as the first substance dissolved in solution by at least about 200 times its molar amount of benzoquinone, said reaction known as the activation reaction being performed in a homogeneous liquid medium;

(b) removal of the reaction products of step (a) and the excess benzoquinone and recovery of the activated Fab fragment;

(c) contacting the activated Fab fragment with the second substance to be coupled.

4,193,983

LABELED LIPOSOME PARTICLE COMPOSITIONS AND IMMUNOASSAYS THEREWITH

Edwin F. Ullman, Atherton, and John M. Brinkley, Oakland, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed May 16, 1978, Ser. No. 906,514

Int. Cl.[2] **G01N** *31/00, 33/16, 23/00;* **A61K** *37/00*

U.S. Cl. 424—12 **17 Claims**

1. In an immunoassay for the determination of an analyte, where the analyte is a member of a specific binding pair consisting of ligand and antiligand and wherein a label is employed which provides a detectible signal, the value of which is affected by the proximity of said antiligand to said label due to the presence of the bulk of said antiligand or a compound conjugated to said antiligand which interacts with said label,

wherein said immunoassay comprises combining in an aqueous medium: (1) a sample suspected of containing said analyte, (2) a reacgent comprising ligand or ligand analog and label, wherein said ligand analog is capable of specific binding to said antiligand, and (3) antiligand, when ligand is the analyte or said antiligand is conjugated with said compound which interacts with said label; and

determining the value of said detectible signal as compared to said value determined with a sample having a known amount of analyte;

the improvement which comprises employing as said reagent discrete colloidal particles comprised of a major portion of lipophilic compounds and a minor portion of label and ligand or ligand analog, wherein said label is covalently conjugated to at least one of said lipophilic compounds, and the ligand or ligand analog are lipophilic or made so by conjunction to a lipophilic compound.

4,193,984

METHOD AND COMPOSITIONS FOR CONTROLLING FLYING INSECTS

Agis F. Kydonieus, New York, N.Y., assignor to Herculite Protective Fabrics Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 675,424, Apr. 9, 1976, abandoned. This application Mar. 23, 1977, Ser. No. 780,398

Int. Cl.[2] **A61L** *3/00, 9/04;* **B32B** *27/08, 27/18*

U.S. Cl. 424—16 **12 Claims**

1. A dispenser for controlling flies comprising

a first section of sheeting comprising an internal layer containing resmethrin as a non-volatile insecticide for said flies and adhered to both sides of the internal layer, solid polymeric layers through which said resmethrin is capable of migrating to become available on outer surfaces of said first section of sheeting; and

a second section of sheeting, having a smaller surface area than the first section, comprising an internal layer containing vanillin as a volatile fly attractant and adhered to both sides of the internal layer, solid polymeric layers at least through one of which said vanillin is capable of migrating to become available on at least one outer surface of said second section of sheeting,

wherein said first and second sections are in contact with each other to form a single unit.

4,193,985

MULTIPLE-UNITS DRUG DOSE

Helle Bechgaard, Hellerup, and Arne M. Pedersen, Vanlose, both of Denmark, assignors to A/S Alfred Benzon, Copenhagen, Denmark

Filed Mar. 23, 1978, Ser. No. 889,269

Claims priority, application United Kingdom, Mar. 30, 1977, 13296/77

Int. Cl.[2] **A61K** *9/22, 9/54*

U.S. Cl. 424—19 **4 Claims**

1. A controlled release upper-gut retentive gastrointestinal tract transit time increasing multiple-units drug dose, which comprises a tablet or a capsule, enclosing subunits of a therapeutically active agent in the form of 0.3 to 1.7 millimeter balls or pellets, each of which are enclosed in an insoluble dialysis membrane of a cellulose ether or acrylic polymer allowing for diffusion of the juices of the gastrointestinal tract, the specific weight of at least 25% by weight of which subunits has been increased from 1.0 or less to at least 1.4 by means of a physiologically innocuous substance of higher specific weight than that of the therapeutically active agent.

4,193,986

FLEA COMPOSITION FOR ANIMALS

Nicholas D. Cox, South Rte., P.O. Box 12, Lavina, Mont. 59046

Filed Sep. 11, 1978, Ser. No. 941,217

Int. Cl.[2] A01N *17/00, 9/02;* C11D *9/50;* A01K *27/00*

U.S. Cl. 424—28 13 Claims

1. A composition for the treatment of flea infested animals comprising an inert vehicle and between about 2% and 7% by weight of natural active ingredients consisting essentially of between about 10 and 40 parts oil of pennyroyal, between about 5 and 20 parts oil of eucalyptus, between about 3 and 10 parts cedar oil, between about 3 and 10 parts oil of citronella, and between about 1 and 2 parts oil of rue.

10. An animal collar treated with the composition of claim 1.

4,193,987

NON-CORROSIVE TOOTHPASTE

Helmut Harth, Mainz, and Dieter Becker, Darmstadt-Wixhausen, both of Fed. Rep. of Germany, assignors to Blendax-Werke R. Schneider GmbH & Co., Mainz, Fed. Rep. of Germany

Filed Dec. 20, 1978, Ser. No. 971,227

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757280

Int. Cl.[2] A61K *7/16*

U.S. Cl. 424—49 4 Claims

1. A non-corrosive aqueous-based toothpaste composition comprising about 0.05% to about 5% by weight of an anticorrosive additive which inhibits toothpaste corrosion of aluminum, said additive being a synthetic alkali metal aluminum silicate zeolite of the formula

$$x(M.AlO_2).ySiO_2.zH_2O$$

wherein M is alkali metal or ammonium, X is a number from 1 to 64, y is a number dependent on X with the determination of y being one-fold to six-fold of X, and Z is a number from 0 to 256.

4,193,988

ORAL HYGIENE COMPOSITIONS

Geoffrey C. Forward, Epsom Downs, and Janet A. Gawthorpe, nee Baylis, Orpington, both of England, assignors to Beecham Group Limited, Great Britain

Continuation-in-part of Ser. No. 493,717, Aug. 1, 1974, abandoned, which is a continuation of Ser. No. 369,451, Jun. 13, 1973, abandoned, which is a continuation of Ser. No. 247,948, Apr. 27, 1972, abandoned. This application Jul. 12, 1978, Ser. No. 924,001

Claims priority, application United Kingdom, Apr. 29, 1971, 12099/71; Dec. 14, 1971, 58064/71

Int. Cl.[2] A61K *7/18*

U.S. Cl. 424—52 5 Claims

1. In a method of enhancing reduction of solubility of dental enamel by an anti-cariogenic oral hygiene composition, the steps of preparing an anti-cariogenic oral hygiene composition having a potentiating combination of sodium monofluorophosphate and calcium glycerophosphate in a weight ratio of 10:1 to 3:1, the sodium monofluorophosphate being present in an amount of 0.08% to 7.6%, by weight, and contacting the dental enamel with the composition.

4,193,989

SUNSCREEN GEL

James Teng, St. Louis County; James M. Lucas, Crestwood, and Marcella C. Stubits, St. Louis, all of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Sep. 27, 1976, Ser. No. 727,169

Int. Cl.[2] A61K *7/42, 7/44*

U.S. Cl. 424—60 5 Claims

1. A water resistant suntan gel capable of forming, by solvent evaporation, a water-resistant film on skin after application of the gel thereon, which consists essentially of about 80 to about 90% alcoholic solvent, about 1 to about 12% ultraviolet radiation absorber which is soluble in said solvent, about 3 to about 7% emollient, about 1 to about 2% gelling agent for said solvent, said gelling agent being selected from the group consisting of hydroxypropyl cellulose acetate, hydroxypropyl starch acetate, and mixtures thereof, said esters having a degree of substitution of about 1.2 to about 3 and a degree of molar substitution of hydroxypropyl groups of about 2 to about 8, and methyl hydroxypropyl cellulose acetate having a degree of molar substitution of hydroxypropyl groups of about 2 to about 8, a degree of substitution of methyl groups of about 0.1 to about 1, and a degree of substitution of acetyl groups of about 0.8 to about 2.5, and about 1 to about 3% of an acid selected from the group consisting of citric acid, adipic acid, succinic acid and malic acid to enhance the binding ability of said gel film to the skin.

4,193,990

HETEROTYPIC CANINE PARVOVIRUS VACCINE

Max J. G. Appel; Leland E. Carmichael, both of Ithaca, and Fredric W. Scott, Brooktondale, all of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Feb. 16, 1979, Ser. No. 12,691

Int. Cl.[2] A61K *39/12*

U.S. Cl. 424—89 2 Claims

1. The method of protecting dogs against disease caused by virulent canine parvovirus which comprises inoculating the animal with a modified live feline panleukopenia virus vaccine.

4,193,991

CANINE PARVOVIRUS VACCINE

Max J. G. Appel, and Leland E. Carmichael, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Dec. 20, 1978, Ser. No. 971,296

Int. Cl.[2] A61K *39/12*

U.S. Cl. 424—89 6 Claims

1. The method of protecting dogs against virulent canine parvovirus which comprises inoculating an animal with inactivated canine parvovirus vaccine prepared in accordance with a process which comprises the steps of growing a strain of canine parvovirus in a non-oncogenic cell culture and then inactivating the virus.

4,193,992

PROCESS FOR THE PREPARATION OF DEFIBRINATED AND LYOPHILIZED PLACENTAL CELLS

Gérard Fontaine, Clarens, Switzerland, assignor to Laboratories Cellorgan S.A., Chatel St. Denis, Switzerland

Filed Dec. 21, 1977, Ser. No. 862,911

Claims priority, application Switzerland, Aug. 16, 1977, 10013/77

Int. Cl.[2] A61K *35/48*

U.S. Cl. 424—105 9 Claims

1. A process for the preparation of defibrinated and lyophilized placental cells comprising breaking into fragments the foetomaternal placenta of a ewe killed at about the end of the fourth month of gestation, immediately submerging the fragments in Ringer's solution in order to wash away traces of blood, finely dividing the fragments and placing them in a 1 to 10% aqueous trypsinated solution, effecting tryptic digestion in said solution with the aid of stirring, separating the placental cells by filtering, washing the cells in refrigerated Hanks medium and separating the cells by centrifuging at a low temperature, suspending the cellular residue obtained from the centrifuging process in survival liquid and lyophilizing the suspension until a constant weight is obtained.

4,193,993
COMPOSITIONS CONTAINING PRESERVATIVE METALS AND THEIR USE FOR THE PRESERVATION OF WOOD AND LIKE MATERIALS AND AS FUNGICIDES

Edward A. Hilditch, Somerset, England, assignor to Cuprinol Limited, Somerset, England

Filed May 10, 1978, Ser. No. 904,606
Claims priority, application United Kingdom, May 12, 1977, 20089/77
Int. Cl.[2] A01N *13/00, 9/00*
U.S. Cl. 424—141 58 Claims

1. In an aqueous ammoniacal preservative composition comprising: p1 (a) a composition of a preservative metal selected from the group consisting of copper, zinc, cobalt, iron, manganese and nickel;

(b) an organic acid; and

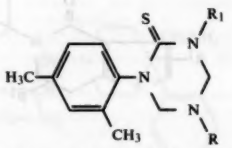
(c) an ammoniacal compound selected from the group consisting of ammonia, ammonia compounds, and mixtures thereof, the amount of ammoniacal compound being at least sufficient to solubilize said compound (a) and to neutralize said acid (b), the improvement wherein said organic acid is a branched chain carboxylic acid having 6 to 20 carbon atoms, a dipentene monocarboxylic acid, a dipentene dicarboxylic acid, or a mixture thereof present in a preserving amount.

4,193,994
TETRAHYDRO-S-TRIAZINE THIONES

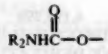
Michael R. G. Leeming, Canterbury; Subramaniyan Narayanaswami, Deal, and Alexander B. Penrose, Tilmanstone, Nr. Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,204
Claims priority, application United Kingdom, Jul. 22, 1977, 30998/77
Int. Cl.[2] C07D *251/08;* A01N *9/12*
U.S. Cl. 424—249 15 Claims

1. A compound selected from the group consisting of



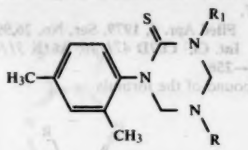
and a pharmaceutically acceptable acid addition salt thereof, wherein R is selected from the group consisting of alkyl having from one to twelve carbon atoms, cycloalkyl having from three to six carbon atoms, adamantyl, benzyl, allyl, propargyl and substituted alkyl wherein said alkyl contains from two to four carbon atoms and said substituent is selected from the group consisting of hydroxy, alkoxy having from one to three carbon atoms, alkanoyloxy having from two to five carbon atoms, methylamino, dimethylamino, phenyl, p-toluenesulfonyloxy and carbamoyloxy of the formula



wherein R_2 is selected from the group consisting of hydrogen, cyclohexyl, phenyl and methyl and Q is selected from the group consisting of oxygen and sulphur, with the proviso that said substituent is substituted on other than the alpha-position of said substituted alkyl; and

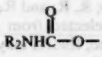
R_1 is selected from the group consisting of alkyl having from one to three carbon atoms and hydroxymethyl.

6. A method for protecting cattle from acarids which comprises applying externally to said cattle in need of such protection an acaricidal amount of a compound selected from the group consisting of



and a pharmaceutically acceptable addition salt thereof, wherein

R is selected from the group consisting of alkyl having from one to twelve carbon atoms, cycloalkyl having from three to six carbon atoms, adamantyl, benzyl, allyl, propargyl and substituted alkyl wherein said alkyl contains from two to four carbon atoms and said substituent is selected from the group consisting of hydroxy, alkoxy having from one to three carbon atoms, alkanoyloxy having from two to five carbon atoms, methylamino, dimethylamino, phenyl, p-toluenesulfonyloxy and carbamoyloxy of the formula



wherein R_2 is selected from the group consisting of hydrogen, cyclohexyl, phenyl and methyl and Q is selected from the group consisting of oxygen and sulphur, with the proviso that said substituent is substituted on other than the alpha-position of said substituted alkyl; and

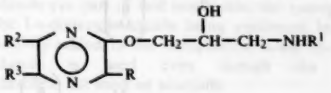
R_1 is selected from the group consisting of alkyl having from one to three carbon atoms and hydroxymethyl.

4,193,995
2-(3-SUBSTITUTED AMINO-2-HYDROXYPROPOXY)-3-SUBSTITUTED PYRAZINE COMPOUNDS AND COMPOSITIONS

Burton K. Wasson, Valois, Canada, and Leonard M. Weinstock, Belle Mead, N.J., assignors to Merck Sharp & Dohme (I.A.) Corp., Rahway, N.J.

Division of Ser. No. 584,439, Jun. 6, 1975, Pat. No. 4,042,586, which is a division of Ser. No. 408,032, Oct. 19, 1973, Pat. No. 3,946,009, which is a continuation-in-part of Ser. No. 341,421, Mar. 15, 1973, abandoned. This application Mar. 8, 1977, Ser. No. 775,678
Claims priority, application Canada, May 5, 1972, 141471
Int. Cl.[2] A61K *31/495;* C07D *241/18*
U.S. Cl. 424—250 8 Claims

1. A pyrazine compound having the structure



or a pharmacologically acceptable salt thereof wherein

R represents C_{1-5}alkyl,

R^1 represents a straight or branched chain C_{3-6}alkyl, a straight or branched chain hydroxy substituted C_{3-6}alkyl, a straight or branched chain C_{3-6}alkinyl, phenyl-C_{1-6}alkyl or indolyl-C_{1-6}alkyl;

R^2 and R^3 can represent the same or different substituents and represent hydrogen, C_{1-3}alkyl, C_{5-7} cycloalkyl, C_{1-3}alkoxy, phenoxy, phenyl, or substituted phenyl wherein the substituent is C_{1-3}alkyl, C_{1-3}alkoxy, amino, acetyl amino, nitro or halo.

7. A pharmaceutical composition in unit dosage form comprising a compound of claim 1 and a carrier.

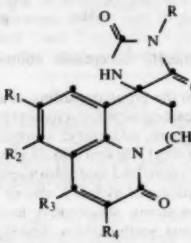
4,193,996

SPIRO-QUINOLONE HYDANTOINS

Rodney C. Schnur, Noank, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Apr. 4, 1979, Ser. No. 26,990
Int. Cl.[2] C07D *471/10;* A61K *31/47*
U.S. Cl. 424—256 **10 Claims**

1. A compound of the formula



and the pharmaceutically acceptable addition salts thereof, wherein n is one or two; R, R_3 and R_4 are each hydrogen; and R_1, and R_2 are each selected from the group consisting of hydrogen, chloro, bromo, fluoro, alkyl of 1 to 3 carbon atoms and alkoxy of 1 to 3 carbon atoms.

6. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a compound of claim **1** in an amount effective for the treatment of diabetic cataracts, neuropathy or retinopathy.

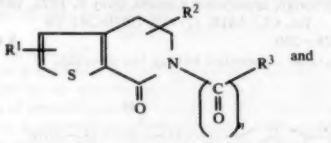
4,193,997

THIENO[2,3-c] AND [3,2-c]PYRIDINES, PROCESS FOR THEIR PREPARATION AND THERAPEUTIC APPLICATIONS THEREOF

Robert Boigegrain, Portet; Michel Gachon, Ramonville St Agne; Jean-Pierre Maffrand, and Gerard Maire, both of Toulouse, all of France, assignors to Parcor, Paris, France

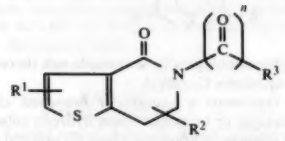
Filed Mar. 15, 1978, Ser. No. 886,688
Claims priority, application United Kingdom, Mar. 29, 1977, 13209/77
Int. Cl.[2] C07D *471/04;* A61K *31/435*
U.S. Cl. 424—256 **10 Claims**

1. Process for the preparation of a compound selected from the compounds having the formulae:



(I)

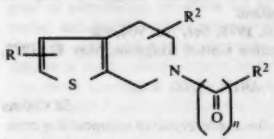
and



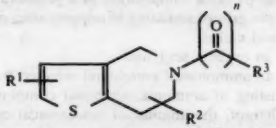
(II)

in which:

R^1 is selected from hydrogen, halogen, C_{1-6} alkyl, C_{1-6} alkoxy and C_{1-6} alkylthio; R^2 is selected from hydrogen, C_{1-6} alkyl, phenyl, carboxy, benzyloxycarbonyl and trimethoxybenzyloxycarbonyl; R^3 is selected from hydrogen, C_{1-12} alkyl, phenyl, benzyl, benzyl substituted by one to three substituents selected from halogen, cyano, C_{1-6} alkoxy and carbomethoxy; and n is selected from 0 and 1, and the therapeutically acceptable acid addition salts of said compounds, comprising oxidizing a compound selected from the compounds having the formulae (III) and (IV), respectively:



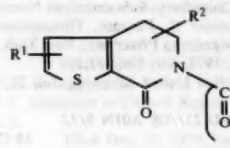
(III)



(IV)

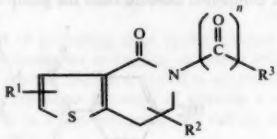
in which R^1, R^2, R^3 and n have the above-defined meanings, with an alkali metal permanganate, in acetone, at a temperature of 40°–56° C.

2. Therapeutic composition having bloodplatelet aggregation inhibiting properties, comprising an effective amount of a compound selected from the compounds having the formulae:



(I)

and



(II)

in which:

R^1 is selected from hydrogen, halogen, C_{1-6} alkyl, C_{1-6} alkoxy and C_{1-6} alkylthio;

R^2 is selected from hydrogen, C_{1-6} alkyl, phenyl, carboxy, benzyloxycarbonyl and trimethoxybenzyloxycarbonyl; R^3 is selected from hydrogen, C_{1-12} alkyl, phenyl, benzyl, benzyl substituted by one to three substituents selected from halogen, cyano, C_{1-6} alkoxy and carbomethoxy; and n is selected from 0 and 1; and their therapeutically acceptable acid addition salts, together with a pharmaceutically acceptable carrier.

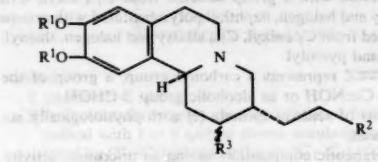
4,193,998

1,2,3,4,6,7-HEXAHYDRO-11BαH-BENZO[A]QUINOLIZINE-DERIVATIVES

Csaba Szantay; Lajos Szabo; Istvan Toth; Erzsebet Kanyo; Gyula Sebestyen, and Sandor Virag, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT, Budapest, Hungary

Filed Jun. 14, 1978, Ser. No. 915,379
Claims priority, application Hungary, Jun. 15, 1977, CI 1751
Int. Cl.[2] A61K *31/47;* C07D *455/06*
U.S. Cl. 424—258 **5 Claims**

1. A compound of the formula I or an acid addition salt thereof



wherein

R^1 is C_{1-4} alkyl or form together a methylene bridge,

R^2 is cyano, or an alkoxycarbonyl group having a C_{1-4} alkyl group in the alkoxy portion,

R^3 is hydroxy or alkanoyloxy having a C_{1-4} alkyl in the alkoxy portion in α- or β-steric position.

4. An antiinflammatory, analgesic and gastric juice secretion inhibiting pharmaceutical composition which comprises as active ingredient an effective amount at least one compound of formula I as defined in claim 1 and the pharmaceutically acceptable acid addition salts thereof mixed with pharmaceutically acceptable carriers.

5. A process for treatment to obtain antiinflammatory, analgesic and gastric juice secretion inhibiting pharmaceutical effects which comprises administering effective amounts of at least one of the compounds of formula I as defined in claim 1, in a pharmaceutically acceptable carrier.

4,193,999

ANTIVIRAL AMINE DERIVATIVES OF PROPANEDIOLS

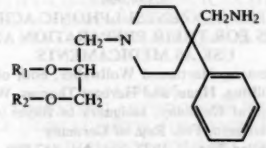
Allen R. Kraska, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 825,535, Aug. 18, 1977. This application Feb. 15, 1979, Ser. No. 12,346

Int. Cl.[2] C07D *211/26;* **A61K** *31/445*

U.S. Cl. 424—267 **9 Claims**

1. A compound selected from those of the formula



and the pharmaceutically acceptable acid addition salts thereof, wherein R_1 and R_2 are each selected from the group consisting of normal alkyl of from 12 to 20 carbon atoms and normal alkenyl not having a double bond in the 1-position of from 12 to 20 carbon atoms.

8. A method of prophylactically controlling a viral infection in a mammal which comprises administering an amount effective to prophylactically control said viral infection of a compound of claim 1.

4,194,000

PSYCHOACTIVE 1,3,4-BENZOTRIAZEPINE-2-THIONES AND A METHOD FOR TREATING CENTRAL NERVOUS SYSTEM DEPRESSION AND ANXIETY

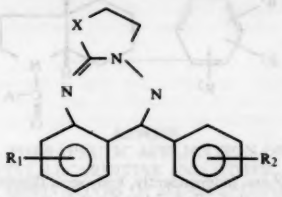
Donald L. Trepanier, and Thomas C. Britton, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 769,126, Feb. 16, 1977. This application Feb. 13, 1978, Ser. No. 877,064

Int. Cl.[2] A61K *31/425, 31/415*

U.S. Cl. 424—270 **3 Claims**

1. A method for treating the symptoms of central nervous system depression or anxiety in a mammal which comprises administering to said mammal an effective psychoactive amount of a compound or a pharmaceutically-acceptable salt thereof having the formula



wherein R_1 and R_2 independently represent hydrogen, lower alkyl, or halo and X represents sulfur or a secondary amine of the formula

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4,194,001

SYNERGISTIC INSECTICIDAL COMPOSITIONS

Colin N. E. Ruscoe, Braywick; Henry G. H. Alner, Wokingham, and Brian C. Baldwin, Wargrave, all of England, assignors to Imperial Chemical Industries Limited, London, England

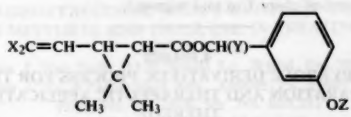
Filed Aug. 29, 1977, Ser. No. 828,826

Claims priority, application United Kingdom, Sep. 6, 1976, 36817/76

Int. Cl.[2] A01N *9/02*

U.S. Cl. 424—273 R **2 Claims**

1. A synergised insecticidal and acaricidal composition comprises an insecticidally effective amount of an insecticide of the formula:



wherein each X is chlorine, Y is hydrogen and Z is phenyl, in combination with a synergistically effective amount of l-n dodecylimidazole in the range of about 5 to 50 parts of l-n-dodecylimidazole per part of said insecticide, the synergistic action of the l-n-dodecylimidazole being evidenced by the acaricidal activity added to the composition when the l-n-dodecylimidazole is used even though the l-n-dodecylimidazole is not itself an acaricide.

4,194,002

CHOLESTEROL ESTER-REDUCING AMIDES OF HEXAHYDROINDOLINOLS

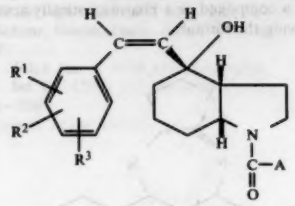
Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Mar. 29, 1978, Ser. No. 891,298

Int. Cl.[2] A61K *31/40;* **C07D** *209/04*

U.S. Cl. 424—274 **32 Claims**

1. A compound of the formula:



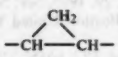
wherein

R^1 and R^2 are, independently, hydrogen, fluorine, chlorine, trifluoromethyl, alkyl of 1 to 4 carbon atoms, or alkoxy of 1 to 4 carbon atoms, and

R^3 is hydrogen, or alkoxy of 1 to 4 carbon atoms, with the proviso that when R^1 and R^2 are both other than hydrogen and R^3 is alkoxy then at least one of R^1 and R^2 is alkoxy, or

R^1 and R^2 are bound to adjacent ring carbon atoms and are together $-(CH_2)_q-$, wherein q is 3 or 4, $-CH=CH-CH=CH-$, or $-O-CH_2-X-$, wherein X is $-O-$ or $-CH_2-$, and

R^3 is hydrogen, fluorine, chlorine, trifluoromethyl, alkyl of 1 to 4 carbon atoms, or alkoxy of 1 to 4 carbon atoms; and A is either of type A', wherein A is the residue of an unsaturated long-chain fatty acid minus the carboxylic portion, said acid having from 8 to 24 carbon atoms and having from 1 to 4 ethylenically unsaturated positions; or A is of type A'', wherein A is a saturated hydrocarbon radical having from 1 to 4 cyclopropanyl groups of the formula



said A having from 7 to 23 carbon atoms plus one carbon atom for each cyclopropanyl group present.

21. A method of reducing the cholesterol ester content of an arterial wall, in a mammal in need of such treatment, comprising administering a cholesterol ester-reducing amount of a compound of claim **1** to said mammal.

4,194,003

NEW PYRROLE DERIVATIVES, PROCESS FOR THEIR PREPARATION AND THERAPEUTIC APPLICATIONS THEREOF

Jacqueline Laforest, Vincennes; Jacqueline Bonnet, Vichy, and Pierre Bessin, Chilly-Mazarin, all of France, assignors to Albert Rolland S.A., Paris, France

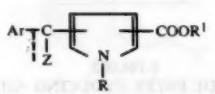
Filed Sep. 26, 1978, Ser. No. 947,337

Claims priority, application United Kingdom, Oct. 10, 1977, 42105/77

Int. Cl.[2] **A61K** *31/40;* **C07D** *207/34*

U.S. Cl. 424—274 **7 Claims**

1. A compound selected from the compounds of the formula



(I)

in which:

R^1 is selected from hydrogen and C_{1-4} alkyl,

R is selected from C_{1-6} alkyl, benzyl and phenyl,

Ar is selected from phenyl, phenyl monosubstituted with a group selected from C_{1-4} alkyl, C_{1-4} alkoxy and halogen, phenyl polysubstituted with groups selected from C_{1-4} alkyl, C_{1-4} alkoxy and halogen, naphthyl, naphthyl monosubstituted with a group selected from C_{1-4} alkyl, C_{1-4} alkoxy and halogen, naphthyl polysubstituted with groups selected from C_{1-4} alkyl, C_{1-4} alkoxy and halogen, thienyl, furyl and pyrrolyl

and $>C\overset{Z}{=}$ represents a carbonyl group, a group of the formula $>C=NOH$ or an alcoholic group $>CHOH$

and the salts of acids of formula (I) with physiologically acceptable bases.

6. A therapeutic composition having an uricosuric activity containing an uricosuric effective amount of a compound selected from the compounds of the formula

(I)

in which:

R^1 is selected from hydrogen and C_{1-4} alkyl,

R is selected from C_{1-6} alkyl, benzyl and phenyl,

Ar is selected from phenyl, phenyl monosubstituted with a group selected from C_{1-4} alkyl, C_{1-4} alkoxy and halogen, phenyl polysubstituted with groups selected from C_{1-4} alkyl, C_{1-4} alkoxy and halogen, naphthyl, naphthyl monosubstituted with a group selected from C_{1-4} alkyl, C_{1-4} alkoxy and halogen, naphthyl polysubstituted with group selected from C_{1-4} alkyl, C_{1-4} alkoxy and halogen, thienyl, furyl and pyrrolyl

and $>C\overset{Z}{=}$ represents a carbonyl group, a group of the formula $>C=NOH$ or an alcoholic group $>CHOH$

and the salts of acids of formula (I) with physiologically acceptable bases

and a pharmaceutically acceptable excipient.

4,194,004

SUBSTITUTED BENZENESULPHONIC ACID ESTERS, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS MEDICAMENTS

Ekkehard Niemers; Hartmund Wollweber, both of Wuppertal; Heinrich Kölling, Haan, and Herbert Thomas, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

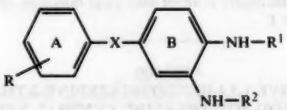
Filed Nov. 2, 1977, Ser. No. 847,890

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1976, 2653766

Int. Cl.[2] **A61K** *31/27, 31/255;* **C07C** *143/68*

U.S. Cl. 424—300 **13 Claims**

1. A substituted benzenesulphonic acid ester of the formula



(I)

in which

R represents hydrogen, a straight-chain or branched alkyl radical with 1 to 6 carbon atoms, unsubstituted or substituted by (C_1-C_4)-alkoxy, (C_1-C_4)-alkylmercapto, halogen or CN; or a formylamino, acetylamino, n-propionylamino, i-butrylamino or n-butyrylamino radical,

X represents the group SO_3 and

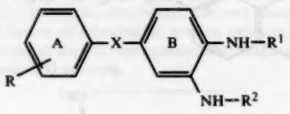
R^1 and R^2 are different from one another and individually represent one of the radicals

wherein

Y represents S and

R^3 represents hydrogen, a straight-chain or branched alkyl radical with 1 to 6 carbon atoms, unsubstituted or substituted by (C_1–C_6)-alkoxy, halogen, (C_1–C_4)-alkylmercapto or cyano, or a pharmaceutically acceptable salt thereof.

4. A pharmaceutical composition containing as an active ingredient an anthelmintically effective amount of a compound of a substituted benzenesulphonic ester of the formula



(I)

in which

R represents hydrogen, a straight-chain or branched alkyl radical with 1 to 6 carbon atoms, unsubstituted or substituted by (C_1–C_4)-alkoxy, (C_1–C_4)alkylmercapto halogen or CN, or a formylamino, acetylamino, n-propionylamino, i-butrylamino or n-butyrylamino radical,

X represents the group SO_3 and

R^1 and R^2 are different from one another and individually represent one of the radicals

wherein

Y represents S and

R^3 represents hydrogen, a straight-chain or branched alkyl radical with 1 to 6 carbon atoms, unsubstituted or substituted by (C_1–C_6)-alkoxy, halogen, (C_1–C_4)-alkylmercapto or cyano, or a pharmaceutically acceptable salt thereof;

in admixture with a solid or liquefied gaseous diluent.

4,194,005

COMBATING ARTHROPODS WITH 4-CYANO-4'-[N-(N'-SUBSTITUTED-BENZOYL)-UREIDO]-DIPHENYL ETHERS

Wilhelm Sirrenberg, Sprockhoevel; Erich Klauke, Cologne; Jürgen Schramm, Dormagen; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

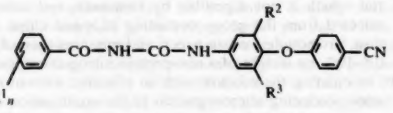
Filed Jul. 27, 1977, Ser. No. 819,631

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638233

Int. Cl.[2] **A01N** *9/20;* **C07C** *121/78*

U.S. Cl. 424—304 **10 Claims**

1. A 4-cyano-4'-[N-(N'-substituted-benzoyl)-ureido]-diphenyl ether of the formula



in which

R^1 is halogen or alkyl,

R^2 is chlorine, bromine or hydrogen,

R^3 is bromine or hydrogen, and

n is 1, 2, 3, 4 or 5.

9. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a compound according to claim **1**.

4,194,006

THERAPEUTIC APPLICATION OF ACETYL-d,l-CARNITINE AND OTHER ACYL DERIVATIVES OF D,L-CARNITINE

Claudio Cavazza, via Marocco 35, Rome, Italy (001/4)

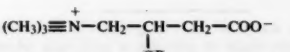
Filed Apr. 10, 1978, Ser. No. 895,044

Claims priority, application Italy, Apr. 29, 1977, 49180 A/77; Feb. 3, 1978, 47898 A/78

Int. Cl.[2] **A61K** *31/22, 31/23*

U.S. Cl. 424—311 **16 Claims**

1. Method of using a composition containing a d,l-carnitine derivative in the therapy of myocardial anoxia, ischaemia, arrhythmic syndromes, and heart fatigue and failure, in animals or in humans which comprises administering an effective dose of said composition to the animal or human for said therapy wherein the d,l-carnitine derivative is (a) a compound of the formula



(I)

or (b) the pharmaceutically acceptable salts of (I) wherein R represents acetyl, propionyl, butyryl, hydroxy-butyryl, or acetoacetyl.

4,194,007

α-HYDROXYRETINOIC ACID, α-KETORETINOIC ACID AND MIXTURES AND THEIR USE IN TREATING SKIN CONDITIONS

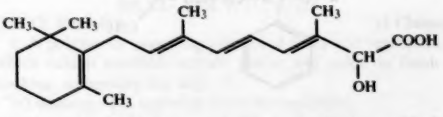
Eugene J. Van Scott, 1138 Sewell La., Rydal, Pa. 19046, and Ruey J. Yu, 4 Lindenwold Ave., Ambler, Pa. 19002

Filed Jan. 13, 1978, Ser. No. 869,351

Int. Cl.[2] **A61K** *31/20;* **C11C** *1/00*

U.S. Cl. 424—318 **14 Claims**

1. The compound of formula:



14. A method for treating the symptoms of a disease selected from the group consisting of dry skin, ichthyosis, acne, dandruff, palmar and planter hyperkeratosis, psoriasis, eczema, mycosis fungoides, Darier's disease, and lichen simplex chronicus

comprising: topically applying to involved areas of the human body a material selected from the group consisting of alpha hydroxyretinoic acid, alpha ketoretinoic acid, and mixtures of alpha hydroxyretinoic acid and alpha ketoretinoic acid in a pharmaceutically acceptable carrier for topical application in an amount sufficient to improve the symptoms of said disease.

4,194,008

N-ARYL-N'-(CYCLO)-ALKYL-THIOUREAS AND THEIR USE AS AGENTS FOR COMBATING ANIMAL PESTS AND PLANT PESTS

Edgar Enders, Cologne; Wilhelm Stendel, Wuppertal, and Ingeborg Hammann, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 25, 1977, Ser. No. 827,902

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639748; Dec. 21, 1976, 2657772; Jun. 18, 1977, 2727416

Int. Cl.[2] A01N *9/12*; C07C *157/05*

U.S. Cl. 424—322 12 Claims

1. An N-aryl-N'-(cyclo)alkyl thiourea or an acid-addition salt thereof selected from the group consisting of N-(2,6-diisopropyl-phenyl)-N'-(3-trifluoromethylcyclohexyl)-thiourea, N-(2,6-di-sec.-butyl-phenyl)-N'-cyclopentyl-thiourea, N-(4-n-butyl-2,6-diethyl-phenyl)N'-cyclohexyl-thiourea.

11. A method of combatting animal and plant pests which comprises applying to the pests, or a habitat thereof a pesticidally effective amount of a compound for combatting a pest of the order isopoda, Diplopoda, Chilopoda, Symphyla, Thysanura, Collembola, Orthoptera, Dermaptera, Isoptera, Anoplura, Mallophaga, Thysanoptera, Heteroptera, Homoptera, Lepidoptera, Coleoptera, Hymenoptera, Diptera, Siphonaptera, Arachnida or Acarina according to claim 1 either alone or in admixture with a diluent or carrier.

4,194,009

ARYLOXYPHENYLPROPYLAMINES FOR OBTAINING A PSYCHOTROPIC EFFECT

Bryan B. Molloy, and Klaus K. Schmiegel, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

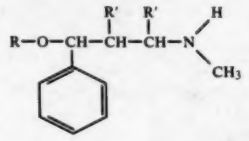
Division of Ser. No. 432,379, Jan. 10, 1974. This application Sep. 15, 1976, Ser. No. 723,349

The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

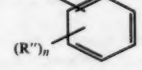
Int. Cl.[2] A61K *31/135*; C07C *91/22*

U.S. Cl. 424—330 1 Claim

1. A pharmaceutical composition in unit dosage form adapted for administration to obtain a psychotropic effect, consisting per dosage unit of a pharmaceutical carrier and a psychotropically effective amount within the range of from 1 to 50 mg. of a compound of the formula:



wherein each R' is independently hydrogen or methyl; wherein R is naphthyl or



wherein R'' and R''' are halo, trifluoromethyl, C_1–C_4 alkyl, C_1–C_3 alkyloxy or C_3–C_4 alkenyl; and
wherein n and m are 0, 1 or 2; and an acid addition salt thereof formed with a pharmaceutically-acceptable acid.

4,194,010

PHARMACOLOGICALLY ACTIVE ENOL ETHER COMPOUNDS

Alexander C. Goudie, Harlow, England, assignor to Beecham Group Limited, United Kingdom

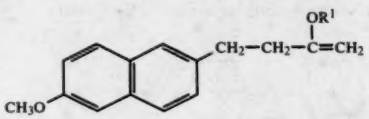
Division of Ser. No. 735,738, Oct. 26, 1977. This application Jun. 2, 1978, Ser. No. 911,797

Claims priority, application United Kingdom, Oct. 29, 1975, 44530/75

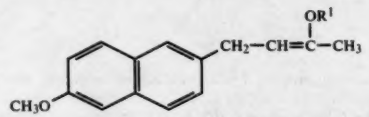
Int. Cl.[2] C07C *43/20*; A61K *31/075*

U.S. Cl. 424—341 12 Claims

1. An enol ether of the formula (II) or (III):



(II)



(III)

in each of which formulas R^1 is alkyl of 2–4 carbon atoms.

4,194,011

MANUFACTURE OF CHEESE

Rutilio Invernizzi, Milan, and Giovanni Prella, Vercelli, both of Italy, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Jul. 29, 1977, Ser. No. 820,299

Claims priority, application Italy, Aug. 2, 1976, 50724 A/76; Feb. 3, 1977, 47896 A/77

Int. Cl.[2] A23C *19/02, 19/14*

U.S. Cl. 426—8 24 Claims

1. A process for the production of cheese which comprises providing a starting material the composition of which is that of the cheese which it is desired to produce, subjecting this material to a thermal pasteurisation or sterilisation treatment, packaging the pasteurised or sterilised material under heat at a temperature equal to 55° C. or above in a hermetic container or containers whilst at the same time adding a lactic fermentation agent to it and, finally, incubating the product thus packaged until fermentation is complete, wherein no drainage takes place once the starting material is provided.

4,194,012

FERMENTED FEED FOR RUMINANTS AND PROCESS FOR PRODUCING SAME

Isao Horiuchi, Kodan 5-101, Yabe-cho, 337 Tozuka-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Apr. 18, 1977, Ser. No. 788,442

Int. Cl.[2] A23K *1/12*

U.S. Cl. 426—53 2 Claims

1. A process for producing a feed for ruminants which comprises the steps of:

(a) mixing about 90–99.5% by weight of a wood fiber material which is not digestible by ruminants and which is selected from the group consisting of wood chips, sawdust, sawpowder, waste paper, and mixtures thereof, and 0.5–10% by weight of a non-protein nitrogen compound;

(b) inoculating the mixture with an effective amount of an ester producing microorganism or the combination of an organic acid producing microorganism and an alcohol producing yeast, whereby esters are formed in said feed by fermentation; and

(c) cultivating said ester producing microorganism or said combination in said mixture for at least 18 hours.

4,194,013

METHIONINE-CONTAINING MICROGRANULATES AND METHOD OF MANUFACTURE

Josef Rehacek, and Jaroslav Dasek, both of Yverdon, Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Feb. 2, 1978, Ser. No. 874,630

Claims priority, application Switzerland, Feb. 22, 1977, 2165/77

Int. Cl.[2] A23J *3/00;* A23L *1/34*

U.S. Cl. 426—96 15 Claims

1. Microgranulates intended for addition to foods having a deficit in methionine so as to increase their nutritive value, comprising a core consisting of microcrystals of methionine of at most about 10 microns in size encapsulated in a matrix comprising a gellable water soluble polymer of spheroid shape in which they are evenly distributed, the core being coated in one or more layers of a vegetable protein extracted from gluten, the diameter of the microgranulates obtained being from about 25 to about 200 microns.

4,194,014

METHOD FOR ADJUSTABLY HEATING A LIQUID

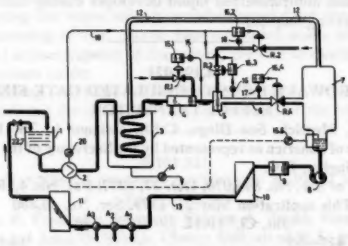
Willem F. Hermans, Amstelveen, and Louwrens J. van Eijk, Nieuw-Vennep, both of Netherlands, assignors to Stork Amsterdam B.V., Amstelveen, Netherlands

Filed Dec. 28, 1977, Ser. No. 865,264

Claims priority, application Netherlands, Dec. 30, 1976, 7614605

Int. Cl.[2] A23L *3/00;* A23C *3/02*

U.S. Cl. 426—231 2 Claims



1. In a method for sterilizing or pasteurizing a liquid food product, wherein the product is heated by a heating medium as it flows through a heating device, with the heated product passing successively through an insulated dwelling stretch so as to effect the desired sterilization or pasteurization of said product in said dwelling stretch and then through a throttle valve into an expansion vessel from which the treated product is discharged, the improvement comprising the steps of:

measuring the amount of product supplied to the heating device per unit of time;

measuring the pressure of the heating medium as supplied to said heating device;

measuring the temperature of the product within the dwelling stretch;

measuring the pressure of the product in the dwelling stretch;

controlling and adjusting the amount of heating medium which is supplied to the heating device per unit of time in dependence on both the measured amount of product supplied to the heating device and the measured temperature of the product within the dwelling stretch;

controlling the pressure of the heating medium as supplied to the heating device in dependence on the measured amount of supplied product and the measured pressure of the heating medium; and

adjusting the throttle valve so that the measured product pressure in the dwelling stretch remains at a constant value irrespective of alterations in the amount of supplied product.

4,194,015

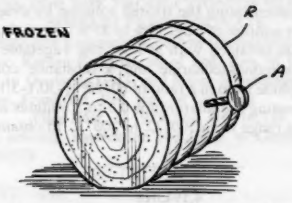
METHOD OF COOKING A FROZEN FOOD ITEM WITH A HEAT PROBE

Albert E. Colato, St. Paul, Minn., assignor to Plastics, Inc., St. Paul, Minn.

Filed Jun. 26, 1978, Ser. No. 919,745

Int. Cl.[2] A01K *43/00*

U.S. Cl. 426—233 1 Claim



1. The method of cooking a frozen food item with the use of a heat probe consisting in inserting an insert rod into the food item in an unfrozen state, then freezing the food item with the insert rod therein, then removing the insert rod from the frozen food item thereby creating a hole in the frozen food item, then inserting a heat probe into the hole in the frozen food item, then cooking the frozen food item with the heat probe therein.

4,194,016

PROCESS FOR PREPARING PRECOOKED FRUITS AND VEGETABLES

Merle L. Weaver, Martinez, and Keng C. Ng, Berkeley, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 809,355, Jun. 23, 1977, abandoned. This application Sep. 11, 1978, Ser. No. 941,340

Int. Cl.[2] A23L *1/212, 1/216*

U.S. Cl. 426—419 12 Claims

1. A process for preparing precooked fruits and vegetables, which exhibit excellent texture, flavor, and color on finish-cooking, comprising the steps of

(a) washing raw, unpeeled fruits or vegetables,

(b) cooking the fruits or vegetables to their centers without damage to the surface tissue thereof, the temperature of said cooking being below the temperature at which sloughing of the fruit or vegetable surface would occur if the fruit or vegetable were cooked to its center at that temperature, said sloughing occurring at a temperature of about 81°–83° C., for a period of about 5 to 45 minutes,

(c) heating the so-cooked fruits or vegetables of step b in air at a temperature of about 66°–93° C. for a period of about 5 to 20 minutes such that the fruit or vegetable tissue has a moisture content above 68%, and then,

(d) preserving the so-heated fruits or vegetables in the absence of starch suspensions.

4,194,017

FLAVORED BOUILLON BASE

Hermann Poiger, Dübendorf, and Lienhard B. Huster, Winterthur, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Continuation of Ser. No. 714,116, Aug. 13, 1976, abandoned.
This application Apr. 25, 1978, Ser. No. 899,719
Claims priority, application Switzerland, Aug. 26, 1975, 11033/75
Int. Cl.[2] A23L *1/231*
U.S. Cl. 426—533 7 Claims

1. A process for the production of a flavouring product reminiscent of meat in taste, which comprises diluting a yeast autolysate with at least the same quantity by weight of water, precipitating substantially insoluble salts, which includes alkaline-earth metal phosphates, by heating the diluted autolysate at a pH-value in the range from about 7 to 8.5, separating solid fractions from the autolysate treated by heating so that only a solution is left, treating the residual solution obtained by steam distillation, concentrating the treated solution by evaporation to a dry matter content of from 75% to 85% by weight, mixing the concentrate obtained with at least one vegetable protein hydrolysate, a monosaccharide and a substance containing sulphur in sulphide form in a ratio of 60–80:15–30:1–3:1–3% by weight, and heating the mixture for 0.5 to 5 minutes to a temperature in the range from 100° C. to 200° C. to obtain a reaction product.

4,194,018

METHOD OF PRODUCING AN AQUEOUS SOYA SUSPENSION

Theodore Hodel, Yverdon; Marcel Buhler, Tolochenaz, and Josef Rehacek, Yverdon, all of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Sep. 30, 1977, Ser. No. 838,130
Claims priority, application Switzerland, Oct. 8, 1976, 12793/76
Int. Cl.[2] A23L *1/20, 2/00*
U.S. Cl. 426—580 12 Claims

1. A process for the production of an aqueous soya suspension, which comprises grinding soya beans in the presence of water at a temperature of from 90° to 100° C. to form a dispersion of particles of which the majority have dimensions of about 100 to 500μ; heating the dispersion by the injection of steam to a temperature of from 120° to 160° C. thereby destroying antitrypsin factor in the soya beans; and grinding the dispersion to form a suspension containing corpuscles of protein and fat with dimensions of about 2 to 10μ and cell wall debris of which the largest dimension does not exceed about 40 to 300μ.

4,194,019

PREPARATION OF AN ACIDIFIED MILK BEVERAGE

Mutsuo Yasumatsu; Kenji Katayama; Shozo Takeuchi, and Yoshio Saito, all of Tokyo, Japan, assignors to Calpis Shokuhin Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 782,396, Mar. 29, 1977, abandoned.
This application Aug. 18, 1978, Ser. No. 934,910
Claims priority, application Japan, Apr. 8, 1976, 52-38776
Int. Cl.[2] A23L *2/00;* A23C *9/10*
U.S. Cl. 426—580 3 Claims

1. A method for the production of a stabilized acidified milk beverage, which consists essentially of

preparing an acidified milk having a milk solids-not-fat content of 0.7 to 1.5 w/w% and a pH value of 3.35 to 3.75 from skim milk and subsequently

subjecting the acidified milk to an ultra-high temperature heating treatment at temperatures in the range of 125° to 160° C. for not more than ten seconds, said process being carried out in the absence of added sugar prior to said ultra-high temperature heating.

4,194,020

METHOD FOR PREVENTING DEGRADATION OF A LIQUID DEVELOPER FOR ELECTROSTATIC RECORDING

Hiroshi Tanaka, Tokyo, and Terukuni Tsuneda, Matsudo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 555,088, Mar. 4, 1975, abandoned. This application Aug. 5, 1977, Ser. No. 822,339
Claims priority, application Japan, May 8, 1974, 49-27616
Int. Cl.[2] G03G *13/10, 13/16*
U.S. Cl. 430—119 4 Claims

3. In an electrophotographic process including the steps of

(a) forming a toner image on a support by developing an electrostatic image on said support with a liquid developer comprising toner particles dispersed in a highly insulating carrier liquid;

(b) transferring said toner image onto a transfer paper containing, as a sizing agent, rosin size and aluminum sulfate, by contacting said toner image with said transfer paper and applying an electric field thereto;

(c) recovering and combining any nontransferred liquid developer remaining on said support with the liquid developer employed in step (a) for reuse in subsequent developing steps; and

(d) repeating steps (a)–(c);

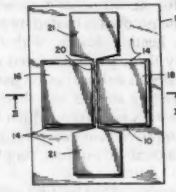
wherein the improvement comprises suppressing the accelerated deterioration of the liquid developer during such repeated use by using a transfer paper containing rosin size and aluminum sulfate, wherein the amount of rosin size is not more than an equimolar amount based on the amount of aluminum sulfate, such that a substantial amount of rosin aluminum soap is not eluted into said nontransferred liquid developer during said transferring step (b).

4,194,021

MICROWAVE INP/SiO_2 INSULATED GATE FIELD EFFECT TRANSISTOR

Louis J. Messick, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 846,070, Oct. 27, 1977, Pat. No. 4,161,739.
This application May 21, 1979, Ser. No. 40,800
Int. Cl.[2] H01L *29/78, 21/316*
U.S. Cl. 427—95 14 Claims



1. The method of making an insulated gate field effect transistor including the steps of:

placing an indium phosphide sample consisting of an indium phosphide n-type semiconducting film deposed on a semi-insulating indium phosphide substrate, in a reaction zone;

introducing a vaporous mixture of nitrogen, oxygen and silane (SiH_4) into said reaction zone;

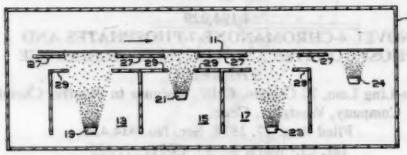
heating said indium phosphide sample to a temperature sufficient to cause the formation of a vitreous SiO_2 film on said semiconducting film without producing interfacial properties unsuitable for the fabrication of field effect transistors;

maintaining said temperature for a period of time sufficient to deposit an SiO_2 film having a thickness suitable as a gate insulating film on the surface of said semiconducting film.

4,194,022
TRANSPARENT, COLORLESS, ELECTRICALLY CONDUCTIVE COATING

Frank H. Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 818,360, Jul. 25, 1977, abandoned. This application Aug. 21, 1978, Ser. No. 935,223
Int. Cl.[2] B05D 5/12, 3/04, 3/10
U.S. Cl. 427—109 7 Claims



1. A method for making a transparent, colorless, electroconductive coated article comprising the steps of:
a. evacuating a vacuum chamber containing a transparent substrate to be coated;
b. vacuum depositing in a partial pressure of oxygen a transparent film of titanium oxide, TiO_x wherein x has a value greater than 1.0 and less than 2.0;
c. vacuum depositing on the titanium oxide film a continuous, transparent, electroconductive film of a metal selected from the group consisting of gold and silver;
d. vacuum depositing in a partial pressure of oxygen a second transparent film of titanium oxide, TiO_x wherein x has a value of greater than 1.0 and less than 2.0, on the electroconductive film;
e. establishing in the vacuum chamber an atmosphere comprising the vapor of a material selected from the group consisting of oils, waxes, heavy organic acids, alcohols and amines capable of decreasing the rate of oxidation of titanium oxide;
f. exposing said films to said atmosphere; and
g. oxidizing the titanium oxide constituents of the coating.

4,194,023
CONTROLLED DEPOSITION OF ASPHALT EMULSIONS

Donald R. Cushman, Wenonah; Charles A. Pagen, West Deptford, and John W. Schick, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 22, 1978, Ser. No. 944,823
Int. Cl.[2] E01C 5/12; B05D 5/10
U.S. Cl. 427—138 9 Claims

1. A method for depositing asphalt from an asphalt emulsion onto an aggregate, that comprises wetting down the aggregate with water containing between about 0.01 weight percent and about 1.0 weight percent of coupling agent selected to have charge opposite to the charge of said asphalt emulsion and applying said asphalt emulsion to the wetted aggregate.

4,194,024
METHOD OF MAKING HYDROPHILIC ARTICLES OF WATER-INSOLUBLE POLYMERS

Arno Holst; Michael Kostrzewa, and Helmut Lask, all of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 838,339, Sep. 10, 1977, abandoned, which is a continuation of Ser. No. 681,730, Apr. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 535,972, Dec. 23, 1974, abandoned. This application May 8, 1978, Ser. No. 904,174
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1973, 2364628
Int. Cl.[2] B05D 3/00
U.S. Cl. 427—180 1 Claim

1. A process for the production of a hydrophilic film of a water-insoluble polymer selected from the group consisting of regenerated cellulose, cellulose ether, cellulose ester, and polyalkylene, and capable of forming films, which comprises sprinkling the surface of said film, in tackified condition, with from an amount effective to render said film hydrophilic up to 50% by weight of the total weight of said film, of amorphous particles of a size within the range of about 0.01 to 2 mm of an orginally water-soluble cellulose ether selected from the group consisting of carboxymethyl cellulose, hydroxyethyl cellulose and methylhydroxyethyl cellulose, prepared from natural cellulose and rendered by chemical cross-linking more than 50% by weight water-insoluble while remaining water-absorbent, said cross-linking agent being selected from the group consisting of dimethylol-methylene bisacrylamide, methylene-bis-acrylamide, tri- and tetra-chloropyrimidine, cyanuric chloride, epichlorohydrin, dichloroacetic acid, a diepoxide and a di-α-halogenohydrin.

4,194,025
PROCESS FOR THE PRODUCTION OF STABILIZED SODIUM PERCARBONATE

Hans Klebe; Gerd Knippschild, both of Rheinfelden, and Hubert Schuster, Karsau-Beuggen, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

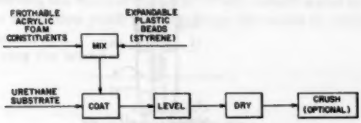
Filed Mar. 1, 1979, Ser. No. 16,729
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1978, 2810379
Int. Cl.[2] C11D 7/54
U.S. Cl. 427—215 10 Claims

1. A process for preparing sodium percarbonate particles comprising a sodium percarbonate nucleus and an encasing layer comprising dehydrated sodium perborate containing less than 54 grams of water per mole and sodium silicate comprising spraying a supersaturated aqueous sodium perborate solution and an aqueous sodium silicate solution on sodium percarbonate particles and then drying to at least partially remove the water.

4,194,026
METHOD OF MANUFACTURING TEXTURED FOAM COATINGS AND MATERIALS

Clark W. Goodale, Simi Valley; Charles W. Morgan, Rolling Hills; Albert L. Rhoton, Cypress, all of Calif., and David F. McNeil, Hickory, N.C., assignors to United Foam Corporation, Compton, Calif.

Continuation-in-part of Ser. No. 664,568, Mar. 8, 1976, abandoned. This application Mar. 18, 1977, Ser. No. 778,985
Int. Cl.[2] B05D 3/02, 5/00
U.S. Cl. 427—244 31 Claims



1. A method of producing a flexible material having a textured surface for use as an acoustical wall and ceiling covering comprising the steps of:
(a) providing a mixture of a curable frothed elastomeric emulsion composition comprising 20 pounds or less of thermally expandable plastic beads to each 100 pounds of said elastomeric composition, said thermally expandable plastic beads having a diameter of at least approximately 0.5 millimeters;
(b) uniformly distributing said mixture over one surface of a flexible urethane foam sheet; and
(c) heating said mixture to expand the plastic beads and to dry and cure the frothed elastomeric emulsion composition to form a textured pebble-like elastomeric coating.

4,194,027
METHOD OF COATING WITH HOMOGENEOUS PYROCARBON

Charles C. Adams; Curtis L. Allen, and Gottfried E. A. Besenbruch, all of San Diego, Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Apr. 21, 1975, Ser. No. 570,223
Int. Cl.[2] C23C *11/00, 13/00*
U.S. Cl. 427—249 **11 Claims**

1. A method of coating items with substantially homogeneous pyrolytic carbon, which method comprises

heating the items to be coated to a temperature of between about 1000° C. and about 2000° C. in an enclosure and flowing a mixture of gases through said enclosure at a rate so that said gases are heated to a temperature approaching the temperature of said items causing gaseous decomposition and deposition of pyrolytic carbon,

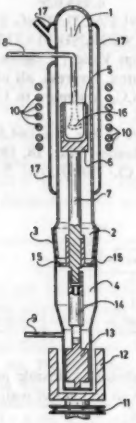
said mixture containing an inert gas portion and a hydrocarbon portion,

said hydrocarbon portion including between about 25 v/o and about 65 v/o of acetylene and the remainder of propylene, said mixture composition being such that the amount of heat needed to raise said gaseous mixture from the temperature at which it enters the enclosure to said decomposition temperature is approximately balanced against the heat given off by the hydrocarbon decomposition.

4,194,028
PROCESS FOR APPLYING A PROTECTIVE LAYER TO SHAPED CARBON BODIES

Erhard Sirtl, Marktl, and Heinz-Jorg Rath, Burghausen, both of Fed. Rep. of Germany, assignors to Wacher-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Aug. 11, 1978, Ser. No. 932,963
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1977, 2739258
Int. Cl.[2] B05D *1/36, 7/22*
U.S. Cl. 427—249 **15 Claims**



1. A process for applying a protective layer to shaped carbon bodies within a reactor, comprising the steps of:

heating the shaped carbon bodies to a temperature of 1250° to 1350° C.;

depositing by vapor deposition the reaction products of a gaseous admixture containing a carrier gas and a member selected from the group consisting of (a) a silicon- and carbon-containing gaseous compound and (b) a gaseous admixture including a silicon-containing gaseous compound and a carbon-containing gaseous compound onto the surface of the shaped carbon bodies so as to produce a silicon carbide layer;

lowering the temperature of the carbon bodies to between 1000° and 1200° C.; and

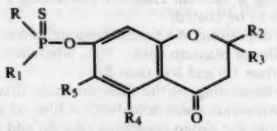
subsequently depositing by chemical vapor deposition from a carrier gas onto the shaped carbon body, the reaction product of a gaseous organosilicon compound and ammonia so as to produce a silicon nitride layer.

4,194,029
NOVEL 4-CHROMANONE-7-PHOSPHATES AND PHOSPHONATES AND THE INSECTICIDAL USE THEREOF

Hsiao-Ling Lam, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

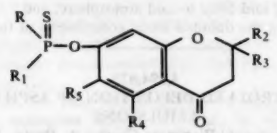
Filed Aug. 17, 1978, Ser. No. 934,436
Int. Cl.[2] A61K *31/35*; C07D *311/22*
U.S. Cl. 424—283 **16 Claims**

1. A compound having the formula



in which R is C_1–C_3 alkyl or C_1–C_3 alkoxy, R_1 is C_1–C_3 alkoxy, R_2 and R_3 are C_1–C_3 alkyl; R_4 is hydrogen or C_1–C_3 alkyl; and R_5 is hydrogen, chloro or C_1–C_3 alkoxy.

12. A method of controlling insects or mites comprising applying to the insects or mites or the locus thereof an insecticidally or miticidally effective amount of a compound having the formula



in which R is C_1–C_3 or C_1–C_3 alkoxy; R_1 is C_1–C_3 alkoxy; R_2 and R_3 are C_1–C_3 alkyl; R_4 is hydrogen or C_1–C_3 alkyl and R_5 is hydrogen, chloro or C_1–C_3 alkoxy.

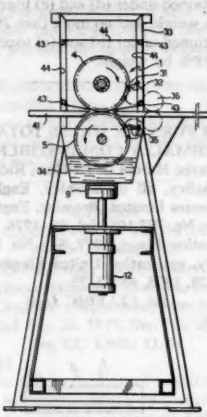
4,194,030
METHOD FOR REINFORCING FABRIC BY APPLYING A FLUID REINFORCING MATERIAL THERETO

Cassiano Fassina, S. Mauro Torinese, Italy, assignor to Codama Holding S.A., Luxembourg

Continuation of Ser. No. 635,544, Nov. 26, 1975, abandoned. This application Oct. 11, 1977, Ser. No. 841,079
Claims priority, application Italy, Dec. 2, 1974, 70493 A/74; Jul. 23, 1975, 68918 A/75
Int. Cl.[2] B05D *5/00*
U.S. Cl. 427—286 **20 Claims**

1. A method of reinforcing a fabric comprising, providing a printing member having a printing face defining 0.05–1 mm deep blind grooves therein, said grooves forming a printing pattern, locating a backing member a predetermined distance from said printing member to receive said fabric therebetween, supplying fluid, settable or curable, reinforcing material to said grooves, said fluid reinforcing material having a Brookfield viscosity of between 10,000 and 25,000 centipoise, feeding a fabric having a thickness at least equal to said predetermined distance between said backing member and said printing member and maintaining said predetermined distance during the entire printing operation so that said printing face engages a

face of said fabric located between said printing member and said backing member with a pressure dependent on said thickness thereby printing an amount of said fluid reinforcing material onto said fabric and penetrating said fluid reinforcing



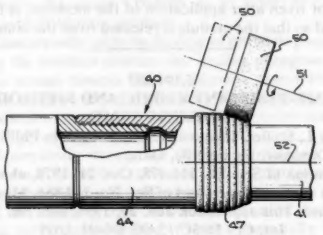
material into said fabric a distance dependent on said pressure in a pattern corresponding to said pattern on said printing member and substantially setting or curing said pattern of reinforcing material to form an elastomeric or plastics material firmly adhering to and reinforcing said fabric.

4,194,031

METHOD OF PROLONGING THE LIFE OF A TOOL JOINT MEANS

Otis O. Cullum, Bakersfield, Calif., assignor to AMF Incorporated, White Plains, N.Y.

Filed Sep. 28, 1978, Ser. No. 946,771
Int. Cl.[2] E21C *13/00*; F16L *15/00*
U.S. Cl. 427—289 **5 Claims**



1. A method of prolonging the life of a tool joint means on a drilling pipe, the joint means including a member having a cylindrical surface with an outer diameter greater than the outer diameter of the pipe and having a tapered portion extending from an edge of the cylindrical surface and joining and welded to the pipe, said tapered portion having a conical surface subjected to severe conditions in a geothermal well hole from fluid in the well hole carrying abrasive particles and under high pressure and temperature; the steps of:

preparing said conical surface of the tapered portion of said tool joint means for deposit of selected metal material;

depositing on said entire conical surface of said tapered portion a quantity of selected material to provide a selected metal hardness at said tapered portion;

and grinding said deposited metal about an axis parallel to said conical surface to provide a hard smooth conical external surface at said tapered portion.

4,194,032

TRANSFER TECHNIQUES FOR PRODUCING FLAME RETARDANT COTTON FABRICS

Robert J. Harper, Jr.; Timothy A. Calamari, Jr., and Sidney P. Schreiber, all of Metairie, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 5, 1975, Ser. No. 555,486
Int. Cl.[2] B05D *3/10*
U.S. Cl. 427—341 **14 Claims**

1. A process for producing flame retardant cotton fabrics, which process comprises:

(a) padding the fabric with a 30 to 40 weight % solution of tetrakishydroxymethylphosphonium hydroxide,

(b) drying the fabric from (a),

(c) kiss roll padding the fabric from (b) with an aqueous solution of ammonium hydroxide to a fabric wet pickup of from 5-40 weight %,

(d) drying the said fabric from (c),

(e) oxidizing the fabric from (d).

4,194,033

PROCESS FOR TREATING WOOD

Takeji Motai, Chofu, Japan, assignor to Shin-Asahigawa Co., Ltd., Japan

Filed Jul. 14, 1978, Ser. No. 924,834
Int. Cl.[2] B05D *3/12, 3/02*
U.S. Cl. 427—351 **6 Claims**

1. A process for treating wood, consisting essentially of:

(a) pretreatment steps consisting essentially of:

(i) dipping the wood into an aqueous alkylamine solution, alkylamine of which has a molecular weight of about 100 and a boiling point of above 90° C;

(ii) heating the wood in the solution to 92° C. to 98° C., and

(iii) maintaining the wood in the solution at this temperature for a time sufficient to soften the wood without destroying its molecular structure, to permit the alkylamine solution to permeate and implant plasticity to the wood and to dissolve and remove resins, hemicellulose, rubbery and chalky substances from within the wood;

(b) main treatment steps consisting essentially of:

(i) dipping the wood treated in step (a) into an aqueous alkylamine solution as defined above;

(ii) subjecting the wood from (b) to boiling under pressure to open closed structures, to render the flow of liquids and gases within the wood more uniform and to permeate and disperse alkylamine within the wood structure;

(c) lowering the moisture content of the treated wood to the fiber saturation point by subjecting the wood to reduced pressure; and

(d) drying the wood.

4,194,034

FLOATING FENDER

Roderick F. R. T. Rijnders, Amersfoort, Netherlands, assignor to International B.F. Goodrich-Europe B.V., Netherlands

Continuation-in-part of Ser. No. 851,305, Nov. 14, 1977, abandoned, which is a continuation of Ser. No. 643,019, Dec. 22, 1975, abandoned. This application Nov. 20, 1978, Ser. No. 962,013

Claims priority, application Netherlands, Dec. 24, 1974, 7416838

Int. Cl.[2] B63B *59/02*
U.S. Cl. 428—36 **4 Claims**

1. A floating vulcanized rubber fender consisting of a matrix, in solid form, manufactured from synthetic rubber having a density not exceeding 0.91 which is free of gas-filled or air-filled closed pores, and from 5–10 parts by weight of carbon black per 100 parts by weight of said rubber, said carbon black

having a particle size smaller than 35 nanometers and which is dispersed throughout said matrix as a filler; said fender having a density not exceeding 0.97, a modulus at 25% elongation of at least 3.5 kg/cm^2, a tear resistance of at least 10 kg/cm^2 and the shape of a thick-walled hollow cylinder with an outer diameter of between substantially 0.3 and 2 m. and an inner diameter varying accordingly between substantially 0.15 and 1½ m; said carbon black being incorporated as a filler in said solid form matrix of rubber solely for its small particle size and high structure, said carbon black having a dibutyl phthalate oil absorption higher than 130 ml/100 gm, and a specific surface by the BET method of more than 130 m^2/gm.

4,194,035

MODIFIED POLYISOCYANATES CONTAINING SULFONIC ACID ESTER GROUPS

Dieter Dieterich, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 8, 1979, Ser. No. 1,814

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1978, 2801129

Int. Cl.^{2} C08G *18/77, 18/14;* C07C *143/68*

U.S. Cl. 528—67 **14 Claims**

1. A process for the preparation of modified polyisocyanates which contain sulfonic acid alkyl ester groups and in which the isocyanate groups may be at least partly in the dimerized form, comprising: reacting isocyanatoaryl sulfonic acids having at least two isocyanate groups and wherein the isocyanate groups may be at least partly in the dimerized form, optionally as mixtures with mono and/or polyisocyanates which are free from sulfonic acid groups, with di- and/or tetrahydrofurans at 0° to 190° C., wherein the equivalent ratio of isocyanate groups, including any isocyanate groups present in the dimerized form, to sulfonic acid groups is greater than 1:1 and the equivalent ratio of di- and tetrahydrofuran groups to sulfonic acid groups is from 0.1:1 to 10:1.

11. Polyisocyanate mixtures, comprising:

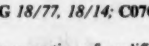
(a) 4 to 48% by weight of isocyanate groups optionally present in the dimerized form,

(b) 0.3 to 38% by weight of groups of the formula —SO$_2$—O— forming part of an aryl sulfonic acid alkyl ester group.

(c) 0 to 36% by weight of sulfonic acid groups,

(d) 0 to 25% by weight of urethane groups —NH—CO—O—, and

(e) 0 to 28% by weight of allophanate groups



the groups mentioned under (d) and (e) together amounting to at least 0.4% by weight and no more than 28% by weight and the groups mentioned under (b) and (c) together amounting to not more than 38% by weight.

13. In a process for the production of urethane groups containing products comprising reacting an isocyanate with an isocyanate receiving group containing compound, the improvement wherein the isocyanate is a polyisocyanate mixture comprising:

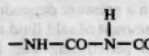
(a) 4 to 48% by weight of isocyanate groups optionally present in the dimerized form,

(b) 0.3 to 38% by weight-of groups of the formula —SO$_2$—O— forming part of an aryl sulfonic acid alkyl ester group,

(c) 0 to 36% by weight of sulfonic acid groups,

(d) 0 to 25% by weight of urethane groups —NH—CO—O—, and

(e) 0 to 28% by weight of allophanate groups



the groups mentioned under (d) and (e) together amounting to at least 0.4% by weight and no more than 28% by weight and the groups mentioned under (b) and (c) together amounting to not more than 38% by weight.

4,194,036

MODULE FOR FURNACE WALLS TOTALLY WRAPPED WITH THERMALLY COMBUSTIBLE MATERIAL

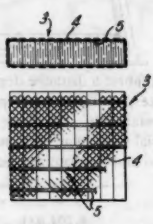
Richard P. B. Davis; Harold G. Emblem; Richard D. Shaw, and Stanley J. Shelley, all of Bromley, England, assignors to Zirconal Processes Limited, Bromley, England

Division of Ser. No. 707,108, Jul. 20, 1976, abandoned. This application Jun. 6, 1977, Ser. No. 804,079

Claims priority, application United Kingdom, Jul. 29, 1975, 31736/75; Nov. 28, 1975, 49043/75

Int. Cl.^{2} E04C *3/10*

U.S. Cl. 428—74 **3 Claims**



1. A module for application to a furnace or oven wall to reduce the thermal inertia thereof, such module being made up of refractory fibers disposed with their axes aligned at right angles to the plane of the module so that they are end-on to the furnace or oven wall, the fibers of said module being totally wrapped and held in elastic compression by a wrapping of thermally combustible material which on first firing of the furnace or oven after application of the modules, is thermally destroyed so that the module is released from the compression.

4,194,037

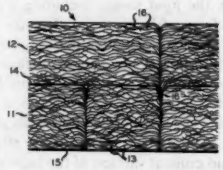
FLAME-RESISTANT FABRIC AND METHOD OF FORMING SAME

Frederick L. Stoller, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 516,478, Oct. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 249,866, May 3, 1972, abandoned. This application Jun. 28, 1976, Ser. No. 700,434

Int. Cl.^{2} D05C *15/00;* D04H *3/08*

U.S. Cl. 428—92 **42 Claims**



1. A method for forming a flame-resistant, nonwoven fabric, comprising:

needling together a multiplicity of base fibers to form a nonwoven, needled batt having upper and lower surfaces,

said base fibers being formed of a material selected from the group consisting of polypropylene, polyester, polyamide, polyacrylic and admixtures thereof;

laying down at least one flame-resistant layer of fibers on the upper surface of said batt to at least substantially completely cover the upper surface of said batt; wherein said layer comprises polyvinyl chloride fibers in an amount sufficient to provide the desired degree of flame resistance;

needling said flame-resistant fibers into said batt to form a nonwoven, needled fabric; and

heating the lower surface of the batt of said needled fabric to a temperature sufficient to adhere together the fibers positioned at said lower surface.

4,194,038

POLY(ESTER-CARBONATES) FROM DICARBOXYLIC ACID CHLORIDES

Josefina T. Baker, Cupertino, Calif.; Robert S. Cooke, Morris Plains, and Stylianos Sifniades, Madison, both of N.J., assignors to Allied Chemical Corporation, Morristown, N.J.

Filed Jan. 25, 1979, Ser. No. 6,947

Int. Cl.[2] C08G *63/64*

U.S. Cl. 528—182 **5 Claims**

1. In a process for production of poly(ester-carbonate) of dihydric phenol and of aromatic or cycloaliphatic dicarboxylic acid from a reaction mixture containing dichloride of at least one such acid, dissolved in a chlorinated hydrocarbon solvent inert under the reaction conditions having from 1 to 6 carbon atoms and from 1 to 4 chlorine atoms, said process employing a tertiary nitrogen base, having pK_b in aqueous solution at 25° C. in the range 7–11, to catalyze condensation of such dihydric phenol with said dichloride and with phosgene employed as carbonate precursor, and to serve as HCl acceptor for the HCl generated in said condensation reactions; the improvement which comprises:

(1) Feeding at least one such dihydric phenol into said dichloride solution at temperature in the range 0°–100° C., said dichloride solution containing at the start of said condensation reaction, phosgene in the range between 10% and 50% of the stoichiometric proportion of phosgene: total dihydric phenol required for formation of the poly(ester-carbonate) final product with the desired mol ratio in the range 1.00:0.05 up to 1.00:0.70 of dihydric phenol:dichloride residues;

(2) Concurrently with the feeding of dihydric phenol, agitating the reaction mixture and feeding phosgene in a separate stream thereto, until all dihydric phenol for the reaction has been added and at least 80% but not over 97% of the stoichiometrically required phosgene for reaction with all hydroxyl groups has been added;

(3) Maintaining during the feeding of dihydric phenol, at least a 10% molar excess of tertiary nitrogen base over that required by stoichiometry;

(4) Then allowing time for the condensation reaction forming poly(ester-carbonate) to come essentially to completion while the phosgene added is being brought at least to the stoichiometrically required quantity for reaction with all hydroxyl groups.

4,194,039

MULTI-LAYER POLYOLEFIN SHRINK FILM

Walter B. Mueller, Taylors, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Apr. 17, 1978, Ser. No. 896,963

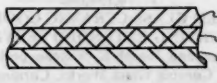
Int. Cl.[2] B32B *7/02, 27/08*

U.S. Cl. 428—213 **18 Claims**

1. A multi-layer, flexible, heat shrinkable thermoplastic packaging film comprising:

(a) at least three layers including (i) a core layer located between the other layers and (ii) an auxiliary layer which is stretch oriented;

(B) said core layer comprising a polymeric blend, 70% to 90% by weight of said blend being selected from the group consisting of homopolymers and copolymers of ethylene and 30% to 10% by weight of said blend being selected from the group consisting of homopolymers and copolymers of butylene; and,



(c) said auxiliary layer comprising a polymer selected from the group consisting of homopolymers and copolymers of propylene.

4,194,040

ARTICLE OF FIBRILLATED POLYTETRAFLUOROETHYLENE CONTAINING HIGH VOLUMES OF PARTICULATE MATERIAL AND METHODS OF MAKING AND USING SAME

Ernest J. Breton; Jack D. Wolf, and Dexter Worden, all of Wilmington, Del., assignors to Joseph A. Teti, Jr. and William C. Teti, both of Philadelphia, Pa., part interest to each

Division of Ser. No. 229,823, Feb. 28, 1972, Pat. No. 3,864,124, which is a continuation-in-part of Ser. No. 818,781, Apr. 23, 1969, abandoned. This application Aug. 22, 1974, Ser. No. 499,583

Int. Cl.[2] B32B *3/26, 5/18*

U.S. Cl. 428—308 **8 Claims**

1. A flexible, self-sustaining, dropable, sheet consisting essentially of from about 85 to about 99 percent, by volume of a solid sinterable particulate material substantially uniformly distributed in a matrix of from about 1 to about 15 percent by volume of fibrillated polytetrafluoroethylene resin, the fibrils of said polytetrafluoroethylene interconnecting and entrapping said sinterable particulate material to impart a self-sustaining condition and flexibility to said sheet.

4,194,041

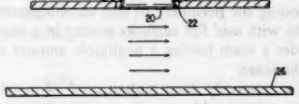
WATERPROOF LAMINATE

Robert W. Gore, Hockessin, and Samuel B. Allen, Jr., Newark, both of Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Jun. 29, 1978, Ser. No. 920,275

Int. Cl.[2] A41B *17/00*; A41D *3/04*; B32B *27/40, 27/28*

U.S. Cl. 428—315 **28 Claims**



1. A flexible layered article suitable for use in waterproof garments, or tents, which permits transfer of water vapor to prevent the build-up of moisture, the layered article retaining its resistance to transmission of liquid water even when the interior face of the article is exposed to a surface tension lowering agent, such as perspiration and body oils, comprising:

(a) a flexible, first layer of hydrophobic material having a moisture vapor transmission rate exceeding 1000 gms./m^2. day and an advancing water contact angle exceeding 90 degrees; and

(b) a continuous hydrophilic layer attached to the inner face of said first layer, said hydrophilic layer having a moisture

vapor transmission rate exceeding 1000 gms./m^2. day and forming a barrier to passage of a surface tension lowering agent that would if present in said first layer tend to reduce the waterproofness of said first layer.

4,194,042

METALLIZED GLASS-CERAMIC COOKING VESSELS EXHIBITING EXTENDED SERVICE LIFE

Harold F. Dates, and Joseph E. Nitsche, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sep. 21, 1978, Ser. No. 944,299
Int. Cl.[2] B32B *15/04*
U.S. Cl. 428—332 **4 Claims**

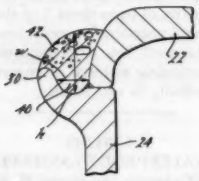
1. In an article of glass-ceramic cookware comprising a glass-ceramic vessel composed of a lithium aluminosilicate glass-ceramic material having a thermal expansion coefficient not exceeding about 25×10^{-7}/°C., at least a portion of the surface of said vessel having a sprayed coating of metallic aluminum having a thickness of at least about 18 mils bonded thereto, the improvement which comprises: forming the coating from sprayed aluminum having an ultimate tensile strength within the range of about 500–3000 psi.

4,194,043

WELDED ALUMINUM DIE CAST ARTICLE

John Lee, Rochester, and Leo Golin, Clawson, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jun. 5, 1978, Ser. No. 912,591
Int. Cl.[2] B23K *15/00*
U.S. Cl. 428—582 **11 Claims**



1. A method of making a high pressure die cast part comprising the steps of:

high pressure die casting a first portion of the part, said first portion having a flat surface forming a plane and having a raised lip projecting from said plane about the periphery of said first portion at an oblique angle to said plane;

high pressure die casting a second portion of the part, said second portion being formed with a complementary flat surface which mates with the plane on said first portion; positioning the periphery of said second portion adjacent said lip with said flat surfaces mating in a manner which provides a seam having a negligible amount of gas flow into the seam;

forming a relatively deep molten pool of metal from said portions within said seam at atmospheric pressure; and

cooling said molten pool of metal to form a relatively dense material near the seam.

8. An article of manufacture comprising:

a first portion having an enlarged raised lip portion projecting therefrom; and

a second portion welded to said first portion by a single pass of welded seam, at least one of said portions being a high pressure die cast material having substantial porosity in the as cast condition and said welded seam having a height substantially greater than its width, said seam being substantially formed from said lip and having substantially all its porosity concentrated in its upper portion distal the weld root and being substantially dense at the weld root.

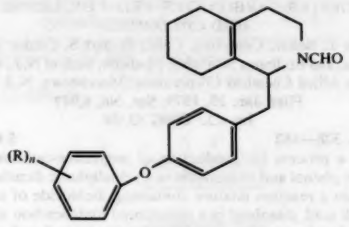
4,194,044

PROCESS FOR PREPARING 3-PHENOXY MORPHINANS

Ernest Mohacsi, Nutley, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

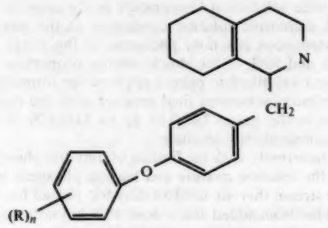
Continuation-in-part of Ser. No. 811,233, Jun. 29, 1977, Pat. No. 4,113,729, which is a continuation-in-part of Ser. No. 748,022, Dec. 6, 1976, abandoned. This application Jun. 12, 1978, Ser. No. 914,656
Int. Cl.[2] C07D *217/20*
U.S. Cl. 546—146 **6 Claims**

1. A compound of the formula:



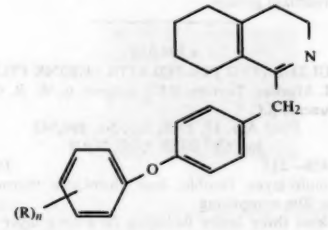
wherein R is halo, lower alkyl, nitro, lower alkoxy, hydroxy or hydrogen; and n is an integer from 1 to 5.

3. A racemic compound of the formula:



wherein R is halo, lower alkyl, nitro, lower alkoxy, hydroxy or hydrogen; and n is an integer from 1 to 5.

5. A compound of the formula:



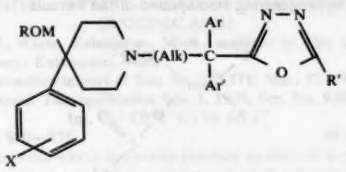
wherein R is halo, lower alkyl, nitro, lower alkoxy, hydroxy or hydrogen; and n is an integer from 1 to 5.

4,194,045
1-(3,3-DIARYL-3-OXADIAZOLALKYL)-4-PHENYL-4-PIPERIDINOMETHANOLS AND RELATED COMPOUNDS

Gilbert W. Adelstein, Evanston, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Dec. 27, 1977, Ser. No. 864,989
Int. Cl.[2] C07D *413/06*
U.S. Cl. 546—209 5 Claims

1. A compound of the formula



and pharmaceutically acceptable acid addition salts thereof wherein Alk is straight or branched chain alkylene having 2–4 carbon atoms; Ar and Ar′ are independently selected from the group consisting of phenyl, alkyl substituted phenyl wherein the alkyl moiety has 1–4 carbon atoms, halo substituted phenyl or pyridyl; M is alkylene having 1 to 4 carbon atoms; R is hydrogen, alkyl having 1 to 4 carbon atoms or alkanoyl having 2–5 carbon atoms; R′ is hydrogen or alkyl having 1 to 4 carbon atoms; X is hydrogen, halogen, alkyl having 1 to 4 carbon atoms or trifluoromethyl.

4,194,046
PREPARATION OF 4,4′-DIPYRIDYLS

Klaus Junghans, Berlin, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Mar. 15, 1979, Ser. No. 20,675
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1978, 2811803
Int. Cl.[2] C07D *213/22*
U.S. Cl. 546—259 11 Claims

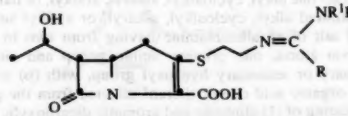
1. In a process for the production of a 4,4′-dipyridyl by electrolysis of a 4-unsubstituted pyridine the improvement which comprises carrying out the electrolysis in liquid ammonia containing a conducting salt.

4,194,047
SUBSTITUTED N-METHYLENE DERIVATIVES OF THIENAMYCIN

Burton G. Christensen, Metuchen; William J. Leanza, Berkeley Heights, and Kenneth J. Wildonger, Somerville, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 733,654, Oct. 18, 1976, abandoned, which is a continuation-in-part of Ser. No. 676,261, Apr. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 634,296, Nov. 21, 1975, abandoned. This application Nov. 17, 1977, Ser. No. 852,425
Int. Cl.[2] C07D *487/04*; A61K *31/40*
U.S. Cl. 546—272 14 Claims

1. The compound of the structure:



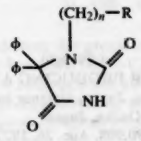
and the pharmaceutically acceptable salts thereof, wherein R^1 and R^2 are independently selected from the group consisting of hydrogen, alkyl having 1–6 carbon atoms, and alkenyl having 2–6 carbon atoms, and R is hydrogen, alkenyl of 2–6 carbon atoms, alkyl, alkoxyalkyl, mono- or dialkyl aminoalkyl, aminoalkyl, amino, perfluoroalkyl, alkylthioalkyl, 3-pyridyl, 4-thiazolyl, phenyl, benzyl, or phenethyl; in any of which alkyl chains, alkyl is 1–6 carbon atoms.

4,194,048
DIPHENYLHYDANTOIN DERIVATIVES

Robert T. Buckler, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

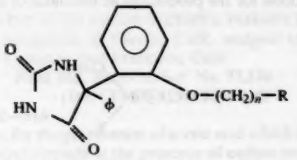
Division of Ser. No. 899,844, Apr. 25, 1978. This application Dec. 7, 1978, Ser. No. 967,131
Int. Cl.[2] C07D *233/72, 233/78*
U.S. Cl. 548—312 6 Claims

1. A compound of the formula:



wherein ϕ is phenyl, $n=2$ through 6, and R is amino.

3. A compound of the formula:



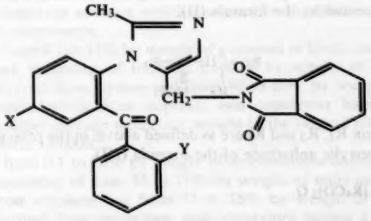
wherein ϕ is phenyl, $n=2$ through 6, and R is amino or carboxyl.

4,194,049
2-[[2-METHYL-1-[2-BENZOYL(OR BENZYL)PHENYL]-1H-IMIDAZOL-5-YL]METHYL]-1H-ISOINDOLE-1,3(2H)-DIONES

George F. Field, West Caldwell, and William J. Zally, Cresskill, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

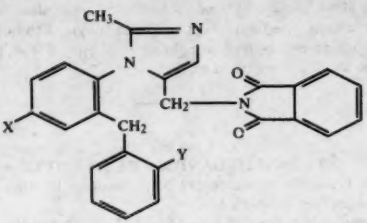
Filed Mar. 29, 1979, Ser. No. 25,219
Int. Cl.[2] C07D *403/06*
U.S. Cl. 548—336 2 Claims

1. A compound of the formula



wherein X and Y are selected from the group consisting of hydrogen, halogen and trifluoromethyl.

2. A compound of the formula



where X and Y are selected from the group consisting of hydrogen, halogen and trifluoromethyl.

4,194,050

PROCESS FOR PRODUCING AN ENAMIDE

Motoo Hazama, Kyoto, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

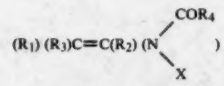
Division of Ser. No. 790,908, Apr. 26, 1977, Pat. No. 4,137,417. This application Jul. 13, 1978, Ser. No. 924,436

Claims priority, application Japan, Apr. 30, 1976, 51-50537

Int. Cl.[2] C07C *102/00, 67/00*

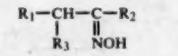
U.S. Cl. 560—41 **10 Claims**

1. A process for the production of enamides of the formula (I),



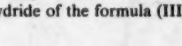
(I)

wherein R_1 and R_2 are independently a hydrogen atom, an alkyl, cycloalkyl, cycloalkylalkyl, aralkyl, aryl, cyano, acyl, carboxyl, carbamoyl, $—CONR_5R_6$, in which R_5 and R_6 are independently an alkyl, aralkyl or aryl group, or $—COOR_5$ group, in which R_5 is as defined above, said alkyl, cycloalkyl, cycloalkylalkyl, aralkyl and aryl groups being substituted or unsubstituted with a halogen atom, a cyano, imidazolyl, N-acylimidazolyl, indolyl, N-acylindolyl group or one of the groups, $—COOR_5$, $—COR_5$, $—CONR_5R_6$, $—OR_5$, $—OCOR_5$, $—NR_5R_6$, $—NHCOR_5$ and $—N(COR_5)_2$, wherein R_5 and R_6 are as defined above, or R_1 and R_2, taken together, may form an alicyclic ring; R_3 has the same meanings as R_2 or R_3 is a hydroxyl, imidazolyl, N-acylimidazolyl, indolyl, N-acylindolyl group or one of the groups, $—COR_5$, $—OR_5$, $—NR_5R_6$, $—NHCOR_5$ and $—N(COR_5)_2$, wherein R_5 and R_6 are as defined above; R_4 is an alkyl, aralkyl or aryl group; and X is a hydrogen atom or R_4CO group, which comprises hydrogenating oximes having at least one hydrogen atom at the α-position represented by the formula (II),



(II)

wherein R_1, R_2 and R_3 are as defined above, in the presence of a carboxylic anhydride of the formula (III),



(III)

wherein R_4 is as defined above,

using a ruthenium catalyst, the amount of said carboxylic anhydride used being at least two times by mole based on the oxime.

4,194,051

ASYMMETRIC CATALYSIS

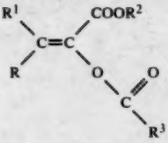
Gerald L. Bachman, and Billy D. Vineyard, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 704,858, Jul. 14, 1976, which is a continuation of Ser. No. 607,090, Aug. 24, 1975, abandoned. This application Aug. 17, 1977, Ser. No. 825,339

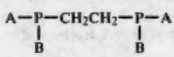
Int. Cl.[2] C07C *69/76*

U.S. Cl. 560—60 **34 Claims**

1. An asymmetric hydrogenation process affording an optical purity of enantiomorph of at least about 86 percent comprising hydrogenating a compound of the formula



wherein R, R^1 and R^2 each independently represent hydrogen, substituted or unsubstituted alkyl having from 1 to 5 carbon atoms or substituted or unsubstituted aryl, and R^3 represents substituted or unsubstituted alkyl having from 1 to 5 carbon atoms or substituted or unsubstituted aryl, provided that, if only one of R and R^1 is hydrogen the Z geometric isomer is hydrogenated, in the presence of from about 0.001% to about 5% by weight, based on said compound, of a homogeneous, coordination complex of rhodium, iridium or ruthenium in combination with an optically active bis phosphine ligand represented by the formula



wherein A and B each independently represent substituted or unsubstituted alkyl of from 1 to 12 carbon atoms, substituted or unsubstituted cyclo alkyl having from 4 to 7 carbon atoms, or substituted or unsubstituted aryl; provided that such substituents provide no significant interference with the steric requirements around the phosphorus atom and A and B are different, said process being conducted at a temperature of from about −20° C. to about 110° C. and said hydrogen concentration being equal to about 0.5 to about 5 times the mole quantity of said compound.

4,194,052

METHOD OF PREPARING NOVEL SULFONIC ACID SALTS OF ACYLOXYALKYLAMINES AND POLYMERS AND COMPOUNDS THEREFROM

Sheldon N. Lewis, Willow Grove, and Jerome F. Levy, Dresher, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 740,480, Jun. 27, 1968, abandoned. This application May 1, 1969, Ser. No. 821,068

Int. Cl.[2] C07C *69/54*

U.S. Cl. 560—155 **10 Claims**

1. Process for the production of an ester of an organic acid which comprises reacting

(a) at least one alkyl, cycloalkyl, alkaryl, aralkyl, or halogen-substituted alkyl, cycloalkyl, alkaryl, or aralkyl sulfonic acid salt of an alkanolamine having from two to eight carbon atoms, one primary amino group and either a primary or secondary hydroxyl group, with (b) at least one organic acid or salt thereof selected from the group consisting of (1) aliphatic and aromatic dicarboxylic acids (2) acrylic, methacrylic, fumaric, and maleic acids, and (3) an alkyl, benzene, naphthalene, alkaryl, aralkyl, or halogen-substituted alkyl, benzene, alkaryl, or aralkyl sulfonic acid salt of a lactam or an amino acid selected from the

group consisting of monoaminomonocarboxylic, monoamino-dicarboxylic, diaminomonocarboxylic, and diamino-dicarboxylic acids,

at a temperature of at least 40° C. while removing water as the reaction proceeds.

4,194,053

PROCESS FOR PREPARING ESTERS OF α-ACETYL-α'-METHYLSUCCINIC ACID AND ESTERS OF α-METHYL-α'-ACETYL-α'-(5-METHYL-3-OXOHEXYL)-SUCCINIC ACID

David R. White, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 778,571, Mar. 17, 1977, abandoned. This application Sep. 1, 1978, Ser. No. 938,972

Int. Cl.² C07C *67/30, 69/67*

U.S. Cl. 560—176 **10 Claims**

1. A process which comprises reacting an ester of acetoacetic acid with an ester of α-halopropionic acid wherein halo is chloro or bromo in a substantially anhydrous mixture of a non-polar, aprotic organic liquid having a dielectric constant below about 11 at 25° C. at a temperature of from about 50° C. to the reflux temperature of the mixture in the presence of a phase transfer agent, a catalytic amount of an iodide ion and a deprotonating base having a surface area equivalent to a size below at least about 60 mesh, for a time sufficient to form the diester of α-acetyl-α'-methylsuccinic acid.

4,194,054

PREPARATION OF SUBSTITUTED FLUOROBENZENES

Heinz Förster, Wuppertal; Hans Klusacek, Cologne, and Arthur Wenz, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

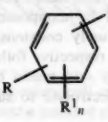
Filed Nov. 7, 1977, Ser. No. 849,294

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1976, 2652810

Int. Cl.² C07C *25/04, 25/13, 63/12*

U.S. Cl. 562—493 **10 Claims**

1. A process for the preparation of a substituted fluorobenzene of the formula

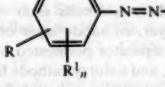


in which

R is alkyl with 1 to 6 carbon atoms, alkoxy with 1 to 4 carbon atoms, fluorine, chlorine, bromine, amino, acetamido, propionamido, butyrylamido, carboxyl, benzyloxy, phenyloxy, benzyloxy or phenyloxy carrying at least one fluorine, chlorine, trifluoromethyl or alkyl substituent with 1 to 4 carbon atoms, and

R^1 is alkyl with 1 to 4 carbon atoms or chlorine, and

n is an integer from 0 to 4, comprising reacting an N-aryl-N',N'-dialkyl-triazene of the formula



in which

Alkyl is alkyl with 1 to 4 carbon atoms, with about a 5 to 25-fold molar excess of anhydrous hydrofluoric acid at a temperature between about −20° and +150° C.

4,194,055

15,16-DIOXY PROSTENOIC ACIDS AND ESTERS

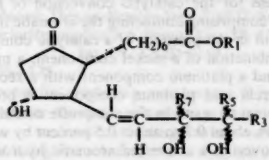
Martin J. Weiss, Oradell, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 767,864, Feb. 11, 1977, Pat. No. 4,111,959, which is a continuation of Ser. No. 663,603, Mar. 3, 1976, abandoned. This application Apr. 5, 1978, Ser. No. 893,781

Int. Cl.² C07C *177/00*

U.S. Cl. 562—503 **7 Claims**

1. An optically active compound of the formula:



wherein R_1 is selected from the group consisting of hydroxy and alkoxy (C_1 to C_3); R_3 is alkyl (C_3 to C_6); R_5 is selected from the group consisting of hydrogen and alkyl (C_1 to C_3); and R_7 is selected from the group consisting of hydrogen and alkyl (C_1 to C_3); and the pharmacologically acceptable cationic salts thereof when R_1 is hydroxy.

6. The optical isomer that is l-erythro-9-oxo-11α,15-dihydroxy-16-methoxy-13-trans-prostenoic acid.

4,194,056

ACETIC ACID FROM METHYL FORMATE

Emilios P. Antoniades, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 30, 1970, Ser. No. 77,328

Int. Cl.² C07C *51/10*

U.S. Cl. 562—516 **5 Claims**

1. Process for the preparation of acetic acid which comprises heating methyl formate in the presence of carbon monoxide, a catalytic amount of a soluble rhodium salt carbonylation catalyst, and an iodine-containing promoter, said heating being carried out at temperatures within the range of from about 150° to 350° C. at pressures in excess of 20 psi and with an excess of one mol of carbon monoxide per mol of said rhodium salt.

4,194,057

POLYMER COMPOSITION VISCOSITY INDEX IMPROVER ADDITIVE AND LUBRICATING OIL CONTAINING THE ADDITIVE

David Brankling, Hull, and John Crawford, Hornsea, both of England, assignors to Orobis Limited, London, England

Filed May 17, 1978, Ser. No. 906,992

Claims priority, application United Kingdom, May 19, 1977, 21109/77; Jul. 13, 1977, 29406/77

Int. Cl.² C10M *1/16*

U.S. Cl. 585—11 **18 Claims**

1. A polymer composition suitable for use as a viscosity index improver additive which composition comprises as essential components:

(A) from 0.1 to 15% by weight of a tapered or block copolymer consisting of from 10 to 40% by weight of units derived from styrene and from 90 to 60% by weight of units derived from isoprene, said copolymer having a number average molecular weight in the range 25,000 to about 125,000,

(B) from 0.1 to 20% by weight of an oil-soluble copolymer consisting of from 25 to 75% by weight of units derived from ethylene and from 75 to 25% by weight of units derived from propylene, said copolymer having a kinematic viscosity, as measured on a 5.0% by weight solution in 150 solvent neutral base oil at 210° F., in the range from 100 to 1500 cS, and

(C) a mineral oil.

4,194,058

PROCESS FOR THE CONVERSION OF AROMATIC HYDROCARBONS

Lee Hilfman, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 810,323, Jun. 27, 1977, Pat. No. 4,148,759, which is a continuation-in-part of Ser. No. 684,055, May 6, 1976, abandoned. This application Dec. 26, 1978, Ser. No. 973,305

Int. Cl.[2] C07C 3/52, 3/62

U.S. Cl. 585—455 9 Claims

1. A process for the catalytic conversion of an aromatic hydrocarbon comprising contacting the aromatic hydrocarbon with a reactant in the presence of a catalytic composite comprising a combination of a nickel component, a molybdenum component and a platinum component with a zeolitic carrier material wherein said platinum component is present in an amount sufficient to result in the composite containing, on an elemental basis, about 0.2 to about 0.5 percent by weight platinum, and recovering a converted aromatic hydrocarbon as a product of the process.

4. The process of claim 1 wherein the conversion reaction which occurs in alkylation of an aromatic compound with an alkylating agent.

7. The process of claim 1 wherein the conversion reaction which occurs in transalkylation of alkylaromatic compounds.

4,194,059

ASSEMBLY FOR AN ELECTROCHEMICAL DEVICE COMPRISING A PLATE AND A SUPPORT

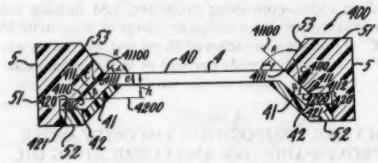
Pierre Durand, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Continuation of Ser. No. 859,442, Dec. 12, 1977, abandoned. This application Dec. 11, 1978, Ser. No. 968,010

Claims priority, application France, Dec. 20, 1976, 76 38622

Int. Cl.[2] H01M 4/00

U.S. Cl. 429—27 12 Claims



1. In an electrochemical device, an assembly comprising a plate, which constitutes a gaseous diffusion electrode, said electrode comprising a porous body with an electron collector, and a support for the plate, characterized by the fact that

(a) the plate has at least one bend, with a bend line, on at least one edge of the plate, a peripheral portion of said bend, referred to as the anchoring zone, being situated in the support;

(b) at least a portion of the support is formed of one or more materials molded onto said anchoring zone;

(c) a face of the support adjacent to the anchoring zone is connected with a face of said plate, along a connecting line, in the form of a uniform junction surface;

(d) an angle C determined, in the vicinity of the connecting line, by the junction surface and the face of the anchoring zone corresponding to said face of the plate is at least equal to 20°;

(e) said face of the support and said face of the plate are intended to be in contact with an electrolyte;

(f) the porous body comprises sintered particles;

(g) the bend is due to a press shaping of the plate leading to microfissures at least in the porous body, said microfissures containing some of the molded material(s);

(h) an angle α, referred to as the angle of the bend, is determined, in the vicinity of the bend line, by said face of the plate and the extension of the corresponding face of the anchoring zone, said angle α being at most equal to 60°.

4,194,060

ELECTRIC ACCUMULATOR AND STORAGE CELL

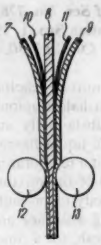
Günter Schöll, Hauffstrasse 14, and Joachim Pauls, Meisenweg 3, both of 7441 Wolfschlugen, Fed. Rep. of Germany

Filed May 17, 1978, Ser. No. 906,855

Claims priority, application Fed. Rep. of Germany, May 18, 1977, 2722461

Int. Cl.[2] H01M 10/06, 4/14

U.S. Cl. 429—67 34 Claims



1. A lead-acid accumulator or storage cell comprising:

a first and a second stack of mutually spaced thin metal foils disposed in interleaved relationship and forming positive and negative plates respectively;

respective separators between the foils of opposite polarity;

a housing receiving the positive and negative plates and the separators between them and containing a sulfuric acid electrolyte, said housing having internal dimensions close to the external dimensions of said stacks and closely surrounding same; and

electrically nonconductive and electrolyte-impermeable masks on only limited areas of juxtaposed faces of foils of opposite polarity surrounding active-mass regions thereof so that each foil has such masks coextensively on each of its faces, the masks of the juxtaposed faces being exactly in registry and of mutually coextensive areas, said masks being bonded to the respective foils and the faces of said foils not covered by said masks being continuously in contact with said electrolyte to sustain electrochemical reaction therewith.

4,194,061

COMPACT HIGH VOLTAGE BATTERY

Edwin H. Land, Cambridge, and Gordon F. Kinsman, Billerica, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

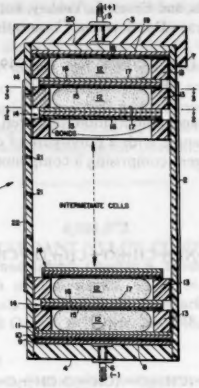
Filed Mar. 23, 1979, Ser. No. 23,309

Int. Cl.[2] H01M 2/12

U.S. Cl. 429—82 6 Claims

1. A battery, comprising a housing, said housing comprising a cylindrical wall and end caps secured to opposed ends of said wall to form a chamber between said wall and said end caps; a plurality of laminar electrical cells stacked in contiguous series relationship in said chamber, said cells each comprising an electrically conductive layer, an anode layer on said electrically conductive layer, a separator permeated by liquid electrolyte on said anode layer, and a slurry cathode layer comprising a dispersion of cathode particles in liquid electrolyte on a central region of said separator; and an insulating spacer on each separator and formed with a central opening within which the cathode layer on said separator is received; the spacer on each separator, except the spacer on the separator in

an end one of said cells, being separated from the spacer on the separator in the next contiguous cell by the electrically conductive layer, the anode layer, and the separator of said next contiguous cell.

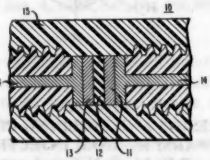


4,194,062

RECHARGEABLE DICHALCOGENIDE CELL

James N. Carides, Bernardsville, and Donald W. Murphy, Warren, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 27, 1978, Ser. No. 928,529
Int. Cl.[2] H01M *6/14*
U.S. Cl. 429—194 13 Claims



1. A nonaqueous secondary cell comprising a negative electrode, an electrolyte, and a positive electrode, CHARACTERIZED IN THAT at least one of said negative electrode and said positive electrode consists essentially of a first layered chalcogenide having the nominal atom composition Li_yMX_2, where M is at least one member selected from the group consisting of V and Ti, X is at least one member selected from the group consisting of S and Se and y is greater than 1.0 and less than or equal to 2.0.

4,194,063

METHOD, COMPOSITION AND ELEMENTS FOR THE DETECTING OF NITROGEN-CONTAINING COMPOUNDS

David S. Frank, and Ignazio S. Ponticello, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 24, 1978, Ser. No. 880,827
Int. Cl.[2] G01N *33/14*
U.S. Cl. 435—12 47 Claims

1. An element for the determination of nitrogen-containing analyte in an aqueous sample, said element comprising at least one enzyme which catalyzes the decomposition of the analyte to ammonia, a β-diketone capable of forming a detectable dihydropyridine on condensation with ammonia in the presence of formaldehyde, and formaldehyde or a formaldehyde source.

4,194,064

PRODUCTION OF NANAOMYCIN B

Satoshi Omura, Tokyo; Haruo Tanaka, Machida; Juichi Awaya, Souka, and Toju Hata, Tokyo, all of Japan, assignors to The Kitasato Institute (Kitasato Kenkyusho), Tokyo, Japan

Continuation of Ser. No. 719,752, Sep. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 558,514, Mar. 14, 1975, abandoned. This application Dec. 7, 1977, Ser. No. 858,216
Claims priority, application Japan, Apr. 15, 1976, 51-42881
Int. Cl.[2] C12D *9/14*
U.S. Cl. 435—125 4 Claims

1. A process for producing nanaomycin B by fermentation which comprises the steps of culturing *Streptomyces rosa var. notoensis* in a medium containing carbon sources, nitrogen sources and inorganic substances at a temperature of from 15 ° to 40° C. and a pH of 6 to 10 for about 2 to 8 days, and recovering as the principal product accumulated nanaomycin B from the cultured broth.

4,194,065

PROCESS FOR PRODUCING COENZYME Q

Yoshio Shimada, Kakogawa; Keiichi Kagotani; Norio Noda, both of Takasago; Hajime Kawaharada, Kakogawa, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 18, 1977, Ser. No. 843,214
Claims priority, application Japan, Oct. 26, 1976, 51-129106
Int. Cl.[2] C12D *13/02*
U.S. Cl. 435—133 12 Claims

1. A process for producing coenzyme Q which comprises aerobically cultivating a yeast in a fermentor, in which maximum specific growth rate is not less than 0.15 hr^{-1} under optimun cultural conditions, in a nutrient medium containing a carbon source in which said yeast can grow, while maintaining the dissolved oxygen concentration in the culture broth at not less than 2 ppm and controlling the average specific growth rate through the whole period of cultivation at not more than 0.1 hr^{-1}, and recovering coenzyme Q from the resulting yeast cells.

4,194,066

IMMOBILIZATION OF ENZYMES OR BACTERIA CELLS

Isao Kaetsu, and Minoru Kumkaura, both of Takasaki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Aug. 20, 1975, Ser. No. 606,209
Claims priority, application Japan, Aug. 30, 1974, 49-99756
Int. Cl.[2] C07G *7/02*
U.S. Cl. 435—182 4 Claims

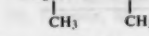
1. A process for producing a porous polymer composition containing immobilized enzymes and/or immobilized bacterial cells which comprises:

forming a mixture consisting essentially of an enzyme solution or a dispersion of bacterial cells and a monomer having the formula

$$CH_2{=}CX{-}\underset{\underset{O}{\|}}{C}{+}O{-}R{\rightarrow}_n{-}OR' \quad \text{or}$$

$$CH_2{=}CX{-}\underset{\underset{O}{\|}}{C}{+}O{-}R{\rightarrow}_m{-}O{-}\underset{\underset{O}{\|}}{C}{-}CX{=}CH_2$$

wherein X is hydrogen or methyl, R is $-CH_2CH_2-$,



or $-CH_2CH_2CH_2-$, R' is hydrogen or alkyl, n is an integer of 2 or more and m is an integer of 4 or more, or a mixture of such monomers; and then

polymerizing and/or copolymerizing the monomer(s) contained in the mixture at a temperature of less than 0° C. by means of an ionizing radiation, thereby depositing the polymer containing enzyme and/or cells from water.

4,194,067

PROCESS FOR THE PURIFICATION OF CARBOHYDRATE CONTAINING ENZYMES

Melvin H. Keyes, Sylvania, Ohio, assignor to Technicon Instruments Corp., Tarrytown, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,477
Int. Cl.[2] C07G 7/00
U.S. Cl. 435—190 **17 Claims**

1. A method for separating a carbohydrate containing enzyme from the enzyme catalase, comprising:

a. mixing a solution containing said carbohydrate containing enzyme with a carbohydrate modifying reagent,

b. allowing said carbohydrate containing enzyme and said modifying reagent to react to modify said carbohydrate,

c. and separating said enzyme from said catalase enzyme.

4,194,068

FLAME RETARDANT COMPOSITION FOR POLYURETHANE COMPRISING BROMOHYDRIN OF PENTAERYTHRITOL AND AN ORGANOPHOSPHORUS COMPOUND

Dennis P. Miller, Midland, Mich., and Masahiko Tamaki, Gotemba, Japan, assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 21, 1978, Ser. No. 888,796
Int. Cl.[2] C08G 18/14
U.S. Cl. 521—107 **13 Claims**

1. A flame-retardant comprising a mixture of at least about 46 percent by weight of a bromohydrin of pentaerythritol, from about 5 to about 45 percent by weight of a polyhydric alcohol and a sufficient amount of a flame-retardant organophosphorus compound to render said mixture a substantially solids-free liquid at 25° C., one atmosphere pressure.

4,194,069

UREA DERIVATIVE AND USE AS POLYURETHANE CATALYST

George P. Speranza, and Robert L. Zimmerman, both of Austin, Tex., assignors to Texaco Development Corporation, White Plains, N.Y.

Filed Oct. 16, 1978, Ser. No. 952,027
Int. Cl.[2] C08G 18/20
U.S. Cl. 521—129 **3 Claims**

1. A method for producing a polyurethane which comprises reacting an organic polyisocyanate with an organic polyester polyol or polyether polyol in the presence of a catalytic amount of N-(3-dimethylaminopropyl)-N'-(3-morpholinopropyl)urea.

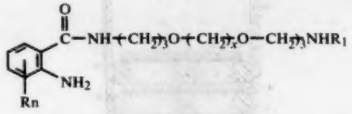
4,194,070

ISATOIC ANHYDRIDE DERIVATIVES AND USE AS CHAIN-EXTENDERS

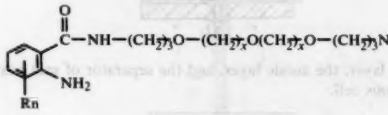
Edward T. Marquis, and Ernest L. Yeakey, both of Austin, Tex., assignors to Texaco Development Corporation, White Plains, N.Y.

Filed Oct. 10, 1978, Ser. No. 949,833
Int. Cl.[2] C08G 18/32
U.S. Cl. 521—163 **3 Claims**

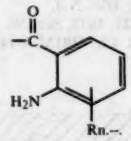
1. A polyurethane composition prepared by reacting an organic polyisocyanate with a polyhydroxy compound and a chain-extending agent comprising a compound of the formula:



or



wherein R is selected from the group consisting of hydrogen, alkyl, nitro, halo, hydroxy, amino and cyano, n is a number of 1-4, x is a number of from 2 to 6 and R_1 is hydrogen or

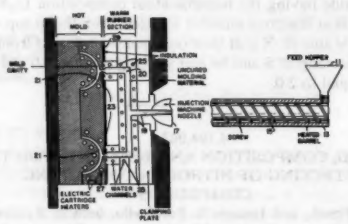


4,194,071

PHENOLIC RESINS AND MOLDING COMPOSITIONS FOR USE IN WARM RUNNER INJECTION MOLDING

Marvin E. Sauers, Belle Mead, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 503,688, Sep. 6, 1974, Pat. No. 3,959,433. This application Feb. 11, 1976, Ser. No. 657,207
Int. Cl.[2] C08G 8/10, 8/28
U.S. Cl. 525—480 **14 Claims**



1. A thermosetting phenolic resin composition comprising:

(a) a molding grade thermosetting phenolic resin; and

(b) an amount of a reactive para substituted phenolic compound that is capable of reducing the viscosity and retarding the curing rate of molding compositions containing said molding grade phenolic resin to provide a molding composition having a processable viscosity at a temperature at which the cure rate is slow enough so that said

molding composition does not cure to a thermoset state during the period of time that said molding composition is in the runner during a normal warm runner injection molding operation, wherein said reactive phenolic compound is a compound having a melting point within the range of from about 35° to about 160° C., wherein the para substituent is alkyl, cycloalkyl, cycloalkenyl, phenyl, alkylphenyl, or hydroxyphenylalkyl, and wherein said reactive phenolic compound is employed in an amount within the range from 9 to about 35 parts by weight, per 100 parts of said molding grade phenolic resin.

4,194,072

FLAME RETARDANT NYLON COMPOSITIONS

Eng P. Chang, Grand Island; Charles S. Ilardo, and Eugene L. Slagowski, both of Tonawanda, all of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, New York

Filed Oct. 2, 1978, Ser. No. 948,066
Int. Cl.[2] C08L 77/02
U.S. Cl. 525—432 12 Claims

1. A flame retardant nylon composition comprising in weight percent, a blend of about 45 to about 70 percent of homopolymers of nylon 6 or nylon 66, or mixture thereof; about 15 to about 25 percent of nylon 612 homopolymer; about 2 to about 10 percent of iron oxide, antimony oxide, zinc oxide, or mixture thereof; and about 10 to about 25 percent of bis(hexachlorocyclopentadieno)cyclooctane.

4,194,073

OLEFIN POLYMERIZATION

Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 4, 1978, Ser. No. 866,900
Int. Cl.[2] C08F 4/24
U.S. Cl. 526—98 18 Claims

1. A process for the polymerization of 1-olefins in the presence of a chromium oxide catalyst and a liquid diluent which comprises adding to the reactor either before, during or after the charging of the diluent to the reactor an effective melt index increasing amount of fluorobenzene under such conditions that a polymer is produced having an increased melt index relative to polymers made under similar conditions in the absence of the fluorobenzene.

9. A process for the polymerization of 1-olefins in the presence of a chromium oxide catalyst the improvement which comprises: carrying out said polymerization in the presence of an effective melt index increasing amount of at least one aromatic compound selected from the group consisting essentially of the fluorine, chlorine and bromine monohalogenated derivatives of benzene and mixtures thereof, under such conditions that a polymer is produced having an increased melt index relative to polymers made under similar conditions in the absence of the aromatic compound.

14. A polymerization process for the polymerization of 1-olefins in the presence of a chromium oxide catalyst and a liquid diluent which comprises the steps of:

(a) reducing said chromium oxide catalyst with a suitable reducing agent,

(b) contacting said reduced catalyst with vapors of at least one aromatic compound selected from the group consisting essentially of: the fluorine, chlorine and bromine monohalogenated derivatives of benzene and mixtures thereof, under such conditions as to add at least one mole of said aromatic compound per mole of chromium present in the catalyst, and

(c) charging said pretreated chromium oxide catalyst to the reactor and then polymerizing said 1-olefin.

4,194,074

POLYMERIZATION PROCESS

Thomas J. Pullukat, Hoffman Estates; Mitsuzo Shida, Barrington, and Raymond E. Hoff, Palatine, all of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 915,056, Jun. 12, 1978, which is a continuation-in-part of Ser. No. 764,914, Feb. 2, 1977, abandoned. This application Mar. 19, 1979, Ser. No. 21,994
Int. Cl.[2] C08F 4/24
U.S. Cl. 526—100 13 Claims

1. The method of making a polymer of ethylene or a copolymer of ethylene with alpha-olefins having a narrow molecular weight distribution, comprising: polymerizing the corresponding monomer or mixtures of monomers under polymerizing conditions with a highly active catalyst prepared by forming a mixture of (1) a porous support of the class consisting of silica, alumina, zirconia, thoria and mixtures thereof, (2) a chromium compound and (3) an alkyl ester of boron containing 1 to about 7 carbon atoms in the alkyl group or a halide of boron, said (2) being reactive with (3) to form a chromium-boron compound upon heating, said mixture containing about 0.1–10 wt.% of boron and about 0.1–10 wt.% of chromium and (4) activating said mixture at an elevated temperature in a fluidized bed with a substantially dry reducing gas and then fluidizing the product of (4) with (5) an oxidizing gas at an elevated temperature, and recovering said polymer or copolymer.

4,194,075

MAGNESIUM REDUCING AGENT-HYDROCARBYLALUMINUM HALIDE COCATALYST FOR TITANIUM TETRAHALIDE

Richard E. Dietz, and Charles M. Selman, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 686,606, May 14, 1976, abandoned. This application May 2, 1978, Ser. No. 902,123
Int. Cl.[2] C08F 4/02, 10/02
U.S. Cl. 526—125 15 Claims

1. A process comprising:

reacting an organic halide having the formula RX or R'X_2 wherein X represents a halogen atom, R is selected from alkynyl, alkenyl, alkyl, aryl, cycloalkenyl, and cycloalkyl radicals and combinations thereof containing from 1 to 12 carbon atoms per molecule and R' is a saturated divalent hydrocarbyl radical containing from 2 to 10 carbon atoms per molecule and magnesium metal in the absence of a complexing diluent to form a magnesium reducing agent reaction mixture containing at least 10 weight percent each of a diorganomagnesium compound and magnesium halide;

mixing the total magnesium reducing agent reaction mixture thus produced with a dihydrocarbylaluminum halide of the formula R"$_2$AlX wherein R" is an alkyl or an aryl radical having 1 to 12 carbon atoms and X is a halogen atom to form a cocatalyst; and thereafter

contacting said cocatalyst with a titanium tetrahalide.

4,194,076

WASHING MAGNESIUM REDUCING AGENT PREPARED IN ABSENCE OF COMPLEXING DILUENT

Richard E. Dietz, and Oscar D. Nowlin, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 686,966, May 14, 1976, abandoned. This application Apr. 27, 1978, Ser. No. 900,555
Int. Cl.[2] C08F 4/02, 10/02
U.S. Cl. 526—125 19 Claims

1. A process comprising:

reacting an organic halide of the formula RX or R'X_2 where X represents halogen, R is an alkynyl, alkenyl, alkyl, aryl, cycloalkenyl or cycloalkyl radical or combination thereof having from 1 to 12 carbon atoms per molecule and R' is

a saturated divalent aliphatic hydrocarbyl radical containing 2 to 10 carbon atoms per molecule and magnesium metal in the absence of any complexing diluent to form a magnesium reducing agent reaction mixture containing at least 10 weight percent each of a diorganomagnesium compound and a magnesium halide;

washing the total magnesium reducing agent reaction mixture thus produced with an unreactive liquid hydrocarbon to remove material soluble in said unreactive liquid hydrocarbon;

contacting said magnesium reducing agent with an organoaluminum compound to form a cocatalyst mixture; and

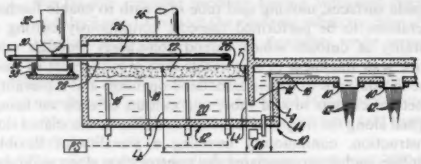
thereafter contacting said cocatalyst mixture with a titanium tetrahalide to form a catalyst.

4,194,077

BATCH SENSOR FOR GLASS-MELTING FURNACES

Sheldon A. Canfield, and Walter J. Karch, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 27, 1977, Ser. No. 864,429
Int. Cl.[2] C03B 5/02
U.S. Cl. 13—6 23 Claims



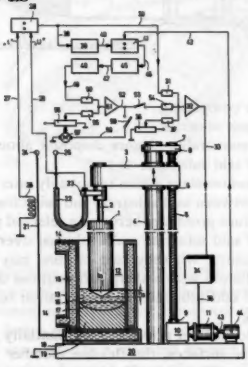
1. Apparatus for controlling the thickness of glass batch in a glass-melting furnace, said apparatus comprising sensing means positioned above the glass batch for measuring the level of the batch without contacting same, said sensing means producing a signal which is responsive to the level of the glass batch, and means responsive to the signal for causing an increase in the thickness of the glass batch when the level decreases and for causing a decrease in the thickness of the glass batch when the level increases.

4,194,078

APPARATUS FOR REGULATING THE DEPTH OF IMMERSION OF CONSUMABLE ELECTRODES IN ELECTROSLAG REMELTING FURNACES

Friedrich W. Thomas, Hasselroth, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Filed Jul. 14, 1978, Ser. No. 924,785
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2732873
The portion of the term of this patent subsequent to Feb. 21, 1995, has been disclaimed.
Int. Cl.[2] H05B 3/60; F27D 11/10
U.S. Cl. 13—9 ES 2 Claims



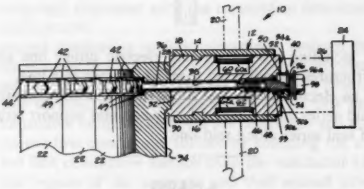
1. In an apparatus for the continuous and automatic regulation of the depth of immersion of a driven remelting electrode in the slag layer of an electroslag remelting furnace, comprising regulating means for maintaining the depth of immersion essentially constant at a predetermined value, the improvement comprising: first circuit means for detecting the actual resistance of the current-path through the slag layer and for producing a first signal corresponding to the reciprocal of the actual resistance corresponding to the conductance of the current path, and second circuit means for detecting the changing of the conductance upon the spatial displacement of the electrode within the slag layer and for producing a second signal defining a correction signal corresponding to the changing of the conductance and means receptive of the first signal corresponding to the reciprocal of the actual resistance from the said first circuit means and the second signal from the second circuit means for algebraically summing the two and responsive to the sum for controlling the driving of remelting electrode to effect immersion thereof to a depth, wherein the relationship between said first signal corresponding to the conductance and the immersion depth is essentially linear whereby a uniform regulation amplification results.

4,194,079

HEATING ELEMENT AND ELECTRODE ASSEMBLY FOR HIGH TEMPERATURE FURNACES

Robert C. Noren, and Michael H. Spritzer, both of San Diego, Calif., assignors to General Atomic Company, San Diego, Calif.

Continuation-in-part of Ser. No. 721,819, Sep. 9, 1976, abandoned. This application Mar. 13, 1978, Ser. No. 885,909
Int. Cl.[2] H05B 3/62
U.S. Cl. 13—25 11 Claims



1. An assembly for maintaining an interconnection between a heating element arranged in a high temperature furnace and an external bus bar, comprising

an electrode means arranged in a wall of the furnace, said electrode means including external means for connection with the bus bar, an internal conductive surface connected with said external means while being arranged for abutting engagement with the heating element and an opening extending between said internal surface and an external surface of said electrode means,

an elongated member effectively engaged with the heating element and movably arranged in said opening, and

adjustable spring means arranged adjacent the external surface of said electrode means and connected to said elongated member for urging the heating element into intimate electrically conductive relation with said internal conductive surface.

4,194,080

UTILITY LINE SUPPORT STRUCTURE

Raymond F. Meisberger, West Chester, Pa., assignor to Bruce-Lake Company, Coatesville, Pa.

Filed Apr. 17, 1978, Ser. No. 897,044
Int. Cl.[2] E04H 12/24, 12/10; H02G 7/20
U.S. Cl. 174—45 R 9 Claims

1. A metal electric utility line support structure for supporting electric power transmission lines, comprising

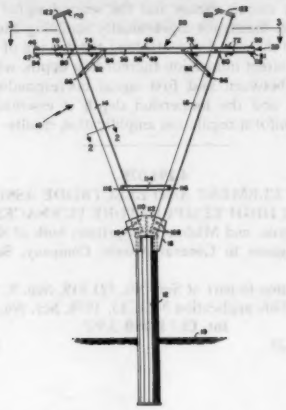
a tubular pole adapted to be erected so as to extend upright from the ground,

a pair of Y arms extending upwardly and outwardly from the top of the pole,

each of said Y arms comprising a structural element having a web, a pair of sidewalls extending at right angles to said web from the edges of said web, a pair of inturned flanges extending at right angles to said sidewalls from the outer edges of said flanges, said flanges being parallel to the web and having edges defining a slot therebetween,

connector means connecting the bottom of the Y arms to the top of the pole,

a crossarm connected between the upper portions of the Y arms for supporting electric utility lines therefrom,



and including a series of said electric utility line support structures spaced apart from each other in a line,

and an electric utility line supported from the crossarms of said series and connected between said support structure of said series along said line.

4,194,081

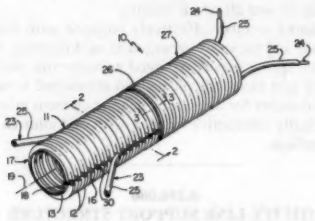
VACCUM CLEANER HOSE CONSTRUCTION HAVING ELECTRICAL CONDUCTORS EXTENDING THEREALONG AND METHOD OF MAKING SAME

Richard D. Medford, and Jerry W. Cooper, both of Waynesville, N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Oct. 11, 1977, Ser. No. 841,176

Int. Cl.[2] **F16L** *11/11, 11/12;* **A47L** *9/24;* **B29D** *23/04*

U.S. Cl. 174—47 **22 Claims**



1. A vacuum cleaner hose construction comprising, a convoluted polymeric tube having alternating outwardly convex crests and outwardly concave troughs, each of said crests having a wall thickness which defines the entire wall thickness of its associated portion of said tube and said troughs having outside surfaces, a plurality of cutouts in said crests aligned along the length of said tube to define a slot construction, said cutouts extending completely through said entire wall thickness and defining associated openings in said tube, a flexible member disposed in said slot construction along said tube, and a polymeric sleeve disposed around said tube and flexible member, said sleeve holding said flexible member within its slot construction while sealing said openings and defining a fluid-tight outer layer for said hose construction, said slot construction and sleeve enabling said flexible member to be provided in said hose construction economically and with minimum weight yet still maintaining flexibility and a sealed interior in said hose construction.

14. A method of continuously making a flexible hose construction comprising the steps of, continuously forming convoluted polymeric tube having alternating outwardly convex crests and outwardly concave troughs, each of said crests having a wall thickness which defines the entire wall thickness of its associated portion of said tube and said troughs having outside surfaces, moving said tube in a path to enable further operations to be performed thereon, continuously cutting a plurality of cutouts which extend completely through said entire wall thickness of said crests during movement of said tube in said path to define associated openings and a plurality of sets of cutouts in said tube, said cutouts of each set being aligned along the length of said tube to define an associated slot construction, continuously inserting a plurality of flexible members each in an associated slot construction along said tube during movement thereof in said path, and continuously disposing a polymeric sleeve around said tube and flexible members while shrinking said sleeve tightly thereagainst to define a convoluted outer surface for said hose construction corresponding roughly to the convoluted outer surface of said tube, said sleeve holding said flexible members within said slot constructions while sealing said openings and defining a fluid-tight outer layer for said hose construction, said slot constructions and sleeve enabling said flexible members to be provided in said hose construction economically and with minimum weight yet still maintaining flexibility and a sealed interior in said hose construction.

4,194,082

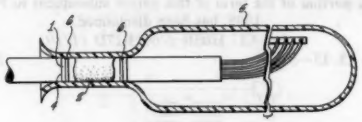
HEAT RECOVERABLE CLOSURE WITH SUBSTRATE PROTECTIVE MEANS

Bruce D. Campbell, Redwood City, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed May 24, 1978, Ser. No. 908,976

Int. Cl.[2] **H02G** *15/04;* **B29C** *27/00;* **B32B** *31/00*

U.S. Cl. 174—74 A **10 Claims**



1. An article comprising:

(a) an elongate substrate;

(b) a heat recoverable closure disposed about an exterior portion of said substrate; and

(c) penetration resistant means removably interposed at least partially between said substrate and said closure for forming a moisture proof seal between a selected portion of the exterior of said substrate and a selected overlying portion of said closure, whereby said closure may be removed after installation with a sharp tool without damage to the exterior of said substrate, the penetration resistant means comprising:

(i) a flexible member possessing substantially parallel inner and outer surfaces, the flexible member having sufficient strength and thickness to protect the elongate substrate from sharp instrumentalities and sufficient flexibility to be wrapped around the elongate substrate; and

(ii) a layer of thermoplastic adhesive juxtaposed a portion of at least one of the surfaces of the flexible metallic member, said adhesive flowing and becoming tacky above a temperature of 200° F., whereby after installation said thermoplastic adhesive removably seals said flexible member between the elongate substrate and the heat recoverable closure.

10. A method for forming a waterproof seal between an

elongate substrate and a heat recoverable closure which provides protection from substrate damage upon forcible removal of said closure employing sharp instrumentalities comprising the steps of:

(a) positioning a flexible metallic member coated on both sides with a thermoplastic adhesive that flows and becomes tacky above a temperature of 200° F. about at least a portion of the exterior surface of said elongate substrate, the flexible metallic member having sufficient strength and thickness to protect the elongate substrate from sharp instrumentalities and sufficient flexibility to be wrapped around the elongate substrate;

(b) affixing said metallic member removably in place;

(c) positioning a portion of an open end of said heat recoverable closure in overlying relationship with said metallic member;

(d) heating said open end of said closure to at least 200° F. to cause said open end to recover about said metallic member and said elongate substrate thereby causing said thermoplastic adhesive to melt and flow; and

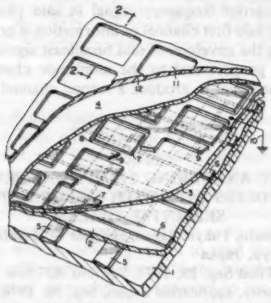
(e) cooling said closure thereby forming a waterproof seal between said closure and said substrate, whereby a sharp instrumentality employed to cut said closure during removal will not penetrate said metallic member and damage said substrate.

4,194,083

CAPACITIVELY COUPLED TABLET

Kiyomi Abe, and Hiromichi Takahashi, both of Soka, Japan, assignors to Pentel Kabushiki Kaisha, Japan

Filed May 23, 1978, Ser. No. 908,790
Claims priority, application Japan, May 24, 1977, 52-60199
Int. Cl.² G08C 21/00
U.S. Cl. 178—18 **11 Claims**



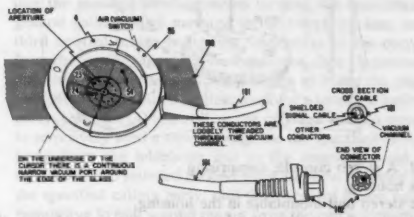
1. A capacitively coupled tablet for use with a probe comprising: two sets of mutually insulated conductors spaced apart along coordinate axes to define a conductor matrix; one set of conductors being sequentially pulsed before the other set of conductors are pulsed in a repeated manner during use of the tablet; an overlay disposed above the sets of conductors and having a plurality of key segments defined in its surface, each key segment being located above a point of intersection of the conductors of each set; and a plurality of electrode plates disposed between the conductors and the overlay and being isolated from each other and corresponding to each of the key segments; whereby the probe can be applied against a particular key segment from over the overlay to achieve capacitive coupling with associated conductors of the respective sets through the electrode plate thereby sensing pulses of given timings from the conductors.

4,194,084

APERTURE CAPACITOR PICKUP

Henry T. Hetzel, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 17, 1978, Ser. No. 952,230
Int. Cl.² G08C 21/00
U.S. Cl. 178—19 **23 Claims**


LOCATION OF APERTURE
AIR (VACUUM) SWITCH
CROSS SECTION OF CABLE
SHIELDED SIGNAL CABLE
OTHER CONDUCTORS
VACUUM CHANNEL
THESE CONDUCTORS ARE LOOSELY THREADED THROUGH THE VACUUM CHANNEL
END VIEW OF CONNECTOR
ON THE UNDERSIDE OF THE CURSOR THERE IS A CONTINUOUS NARROW VACUUM PORT AROUND THE EDGE OF THE GLASS

1. Apparatus for optical alignment with and capacitive coupling to a conductor, the apparatus comprising:

a transparent first conductive surface for capacitive coupling to the conductor at a location along the conductor that is in optical alignment with the transparent first conductive surface; and

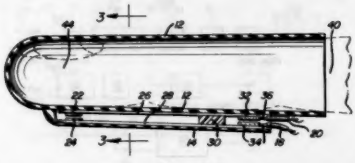
a second conductive surface, electrically isolated from the transparent first conductive surface, physically interposed between the conductor and the transparent first conductive surface, and having an aperture that first limits the capacitive coupling between the conductor and the transparent first conductive surface by shielding the transparent first conductive surface from the conductor except in the region of the aperture and that second provides a region at least through which the apparatus is optically alignable with the conductor.

4,194,085

FINGER KEYER FOR CODE TRANSMISSION

Joseph I. Scelzi, P.O. Box 600-710, North Miami Beach, Fla. 33160

Filed Sep. 14, 1978, Ser. No. 942,912
Int. Cl.² H01H 21/86
U.S. Cl. 178—101 **6 Claims**

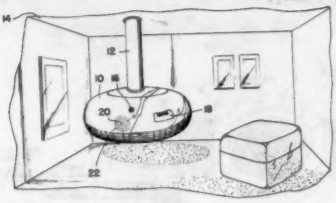


1. A keyer device for manual coded electrical signal production for code practice or transmission by an operator comprising removable wearing means insertible over a digit of the operator and signal producing means attached to said wearing means for production of said coded electrical signal in the form of dots and dashes, wherein said signal producing means comprises an elongated flexible hollow cavity attached to and independent of said wearing means, said cavity enclosing a keyer mechanism for alternate opening and closing of an electrical circuit, wherein said wearing means comprises a flexible sheath into which said digit is insertible, said keyer mechanism in the cavity being operable by manual pressure exerted on the keyer mechanism by said digit forcing the cavity against a solid object, whereby the closing of the electrical circuit is effected by said manual pressure, and the opening of the electrical circuit is effected by release of said manual pressure.

4,194,086
SUSPENDED STEREO CONSOLE AND LIGHT SHOW

Anthony Solla, 5425 Valles Ave., Bronx, N.Y. 10471

Filed Dec. 7, 1977, Ser. No. 858,191
Int. Cl.[2] H04R 5/02
U.S. Cl. 179—1 G 3 Claims

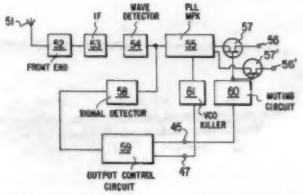


1. A stereo console, comprising
a housing,
a stereo unit mountable in the housing,
means of mounting the housing in a room, wherein the means of mounting the housing in a room is a column attached to an upper portion of the housing and mountable to a ceiling of a room, in which
two loudspeakers are connected to the stereo unit so as to produce stereophonic reproduction of sound and each loud speaker is mounted to an opposed vertical inclined side of the housing in the mounted position of the housing, with
said housing mounted to the column by rotatable means so that the housing may continuously rotate with respect to the column so as to disperse stereophonic sound reproduction to various opposite sides of a room as the housing rotates about a vertical axis with respect to the column, when the column is mounted from a ceiling of a said room.

4,194,087
CONTROL CIRCUIT AND FM STEREO RECEIVER USING SAME

Kaku Sakaida, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed May 8, 1978, Ser. No. 903,783
Claims priority, application Japan, May 17, 1977, 52-56550
Int. Cl.[2] H04H 5/00; H03K 5/153
U.S. Cl. 179—1 GD 6 Claims

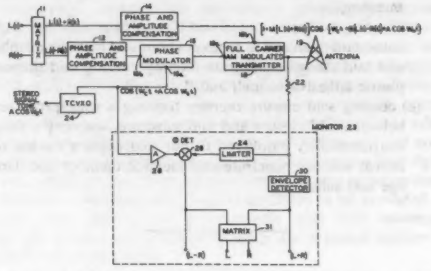


1. Circuitry for generating from an input signal having leading and trailing edges at least two output control signals where the leading and trailing edges of the first one of said two output control signals respectively precede and follow the leading and trailing edges of the second one of said two output control signals, said circuitry comprising
a first transistor responsive to said input signal;
time constant circuit means having a predetermined time constant connected to said first transistor;
a second and third transistors responsive to said first transistor and said time constant circuit means;
bias means for so establishing different operating voltages for said second and third transistors that, upon application of said input signal to said first transistor, said first and second output control signals are respectively outputted by second and third transistors due to the fact that they are actuated at different times by the output signal from said first transistor and said time constant circuit depending on whether the input signal is rising or falling.

4,194,088
MODULATION MONITOR FOR AM STEREOPHONIC BROADCASTS

Robert D. Streeter, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Mar. 15, 1978, Ser. No. 886,707
Int. Cl.[2] H04H 5/00
U.S. Cl. 179—1 GS 2 Claims



2. A method for providing monitor signals from an AM stereophonic broadcast signal, said signal comprising a carrier frequency signal being modulated in phase with a first channel of information and subsequently modulated in amplitude with a second signal comprising:
a. supplying a sample of said carrier frequency signal to one input of a phase detector;
b. amplitude limiting a portion of said broacast signal;
c. combining said amplitude limited signal with said sample of said carrier frequency signal in said phase detector whereby said first channel of information is provided; and
d. detectng the envelope of said broadcast signal to provide a signal proportional to the amplitude changes in said broadcast signal to produce a second channel of information.

4,194,089
AUTOMATIC ANSWERING TELEPHONE SET HAVING AN ENDLESS TAPE WITH A PLURALITY OF SELECTIVE TRACKS

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Sep. 29, 1977, Ser. No. 837,814
Claims priority, application Japan, Sep. 30, 1976, 51-117706
Int. Cl.[2] H04M 1/64, 1/65
U.S. Cl. 179—6 E 4 Claims

1. An automatic telephone answering set comprising:
(a) an endless magnetic medium means having first and second half portions successively disposed along the length thereof so that as said endless magnetic medium is driven the first half portion is encountered prior to the second half portion, said endless magnetic medium including (1) a first endless track where there is pre-recorded in said first half portion of the endless magnetic medium a message for a general calling party and (2) a plurality of further endless tracks in which there is prerecorded in said second half portion of the endless magnetic medium a message for a specified calling party so that after said general calling party message is reproduced, one of said specified calling party messages can be reproduced without having to rewind said endless magnetic medium;
(b) a magnetic head for (1) selectively reproducing the mes-

sage for the general calling party and the messages for the specified calling parties and (2) selectively recording new messages for the specified calling parties on the endless tracks therefor of the endless magnetic medium means in place of the pre-recorded messages for the specified calling parties;

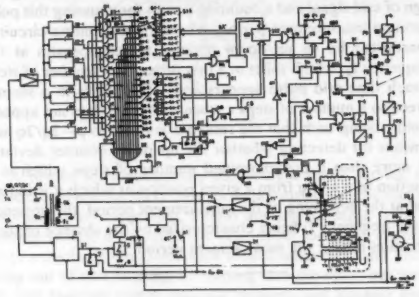
(c) drive means for driving the endless magnetic medium;

(d) means for selectively moving the magnetic head to the portions of the endless tracks for the specified calling parties from the portion of the endless track for the general calling party;

(e) message sending means for (1) selectively sending to a telephone line the message reproduced by the magnetic head from the endless track for the general calling party and the messages reproduced by the magnetic head from the endless tracks for the specified calling parties and (2) selectively sending to the magnetic head the new messages for the specified calling parties derived from the telephone line;

(f) ringing signal responsive means for providing an output in response to a ringing signal derived from the telephone line;

(g) call information responsive means for providing a first output in response to first call information for the specified calling parties derived from the telephone line and a second output in response to second call information derived from the telephone line for a person in a position to give a message to the specified calling parties, said



second call information comprising a first information part identical with said first call information and a second information part following the first information part;

(h) first control means for (1) controlling the drive means to drive said first endless track of the endless magnetic medium means by the magnetic head to thereby reproduce the message for the general calling party and (2) controlling the message sending means to send the reproduced general calling party message to the telephone line, said first control means being responsive to the output from the ringing signal responsive means when only the ringing signal is derived from the telephone line;

(i) second control means for (1) controlling first the drive means to drive said first endless track of the endless magnetic medium means by the magnetic head to thereby reproduce the message for the general calling party, (2) controlling the message sending means to send the reproduced general calling party message to the telephone line, said second control means being first responsive to the output from the ringing signal responsive means and then (3) controlling the magnetic head moving means to bring the magnetic head to a selected endless track for a specified calling party and then drive said selected track by the magnetic head to thereby selectively reproduce the prerecorded specified calling party message and to send it to the telephone line by the message sending means, said second control means being further responsive to said first output from the call information responsive means when there is only sequentially applied thereto the ringing signal and said first information part of the call information signal whereby said specified calling party message can be reproduced after said general calling message without having to rewind said endless magnetic medium means; and

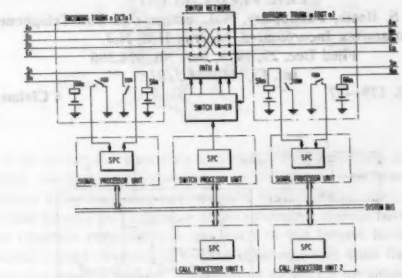
(j) third control means for (1) controlling first the drive means to drive said endless track of the endless magnetic medium means by the magnetic head to thereby reproduce the message for the general calling party, (2) controlling the message sending means to send the reproduced general calling party message to the telephone line, said third control means being first responsive to the output from the ringing signal responsive means, then (3) controlling the magnetic head moving means to bring the magnetic head to a selected endless track for a specified calling party, and then (4) controlling the message sending means to selectively send a new message for the specified calling party from the telephone line to the magnetic head to record on said selected endless track the new message for the specified calling party, said third control means being responsive to said second output from the call information responsive means when there is only sequentially applied thereto the ringing signal from the telephone line, the said first information part of a selected call information from a person in a position to give a message to the specified calling party from the telephone line, the said second information part of the selected call information from the telephone line and said new message for the specified calling party from the telephone line via the message sending means.

4,194,090

DECENTRALIZED-CONTROL TYPE ELECTRONIC SWITCHING SYSTEM

Hideo Yabe, and Shohei Sato, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 854,968, Nov. 25, 1977, abandoned. This application Aug. 31, 1978, Ser. No. 938,740
Claims priority, application Japan, Nov. 27, 1976, 51/142607
Int. Cl.[2] H04Q *3/54*
U.S. Cl. 179—18 ES **3 Claims**



1. A decentralized control-type electronic switching system comprising:

at least one signal processor accommodating a plurality of communication lines for receiving, storing and analyzing a line signal and a register signal sent from said communication lines, for transmitting a line signal and a register signal to said communication lines, and for storing an idle or busy state of said communication lines;

at least one call processor for determining said signal processor which accommodates an outgoing line to be connected to an incoming line on the basis of a signal received from said signal processor via said incoming line;

at least one switch processor for storing an idle or busy state of links in a switch network, for responding to a request

from another processor for seeking for an idle path between two communication lines designated by said request, for storing and connecting said path, and for responding to a request from another processor for disconnecting a path between two communication lines designated by said request;

a common system bus for carrying out data transfer between said respective processors; and

an oscillator for generating system clock pulses to be used for controlling said data transfer, each of said processors including:

a system clock counter for controlling a sequence of data transmission onto said system bus, said counter being set at an initial value upon starting of said switching system and thereafter stepped in synchronism with said system clock pulses;

inhibit means operable when one processor is ready to transfer data therefrom to another processor for inhibiting the feed of the system clock pulses;

sending means for transmitting said data onto said system bus upon coincidence of the count in said system clock counter with an assigned processor number;

receiving means for receiving data from said system bus but storing the data only when an addressed processor number contained in said data coincides with an assigned processor number; and

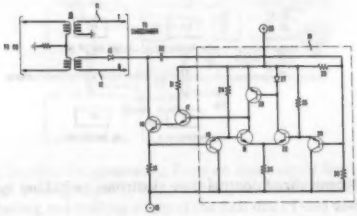
means for releasing said inhibit means to restore the feeding of the system clock pulses after the data transmission has been completed, whereby the data transfer between said processors can be accomplished.

4,194,091

LINE FEED CIRCUIT

Barry S. Bosik, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1978, Ser. No. 974,386
Int. Cl.[2] H04M *3/02*
U.S. Cl. 179—77 **4 Claims**



1. A line feed circuit for telephone subscriber loops characterized by

an operational amplifier,

a constant current source utilizing said operational amplifier in its direct current mode

a bypass capacitor connected around said constant current source, and

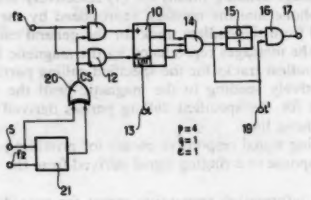
means for utilizing said operational amplifier in its alternating current mode for multiplying the value of said bypass capacitor.

4,194,092

DEVICE FOR DETECTING A FREQUENCY IN A PCM CODED SIGNAL

Jacques Luder, Ris Orangis, France, assignor to Compagnie Industrielle des Telecommunications, Paris, France

Filed Jun. 6, 1978, Ser. No. 913,163
Claims priority, application France, Jun. 10, 1977, 77 17814
Int. Cl.[2] H04Q *1/46*; H04B *3/20*
U.S. Cl. 179—84 VF **2 Claims**



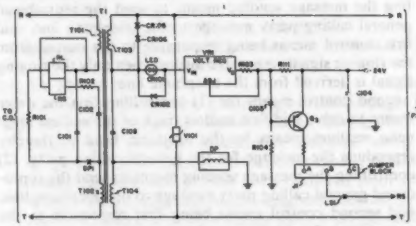
1. An arrangement for detecting a frequency f_1 in a signal which is in PCM coded form, whose sampling frequency is f_2, $f_2 \approx p/qf_1$, p and q being integers and p being greater than 2q, including a circuit which delivers a pulse at each change of sign of said signal and a counting circuit for counting this pulse during a measurement period, wherein the counting circuit is constituted by an up/down counter which operates at the frequency f_2, which shifts in a first direction a number of steps a each time said pulse appears and which shifts in a second direction a number of steps r when said pulse does not appear, a and r being such that the ratio a/r is equal to $p-2q/2q$ and a means for detecting whether the up/down counter deviates by more than a predetermined number of steps which is a function of p and q from a given position at which it is initialized at the beginning of the measurement period, the presence of the frequency f_1 being characterized by the absence of such detection during the measurement period.

4,194,093

KEY SYSTEM PROTECTIVE APPARATUS

Orland L. Davis, Jr., and Charles E. Moore, Jr., both of Corinth, Miss., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 29, 1978, Ser. No. 964,620
Int. Cl.[2] H04M *1/00*; H04Q *5/18*
U.S. Cl. 179—99 R **6 Claims**



1. Apparatus for isolating a line circuit for a key telephone system from the exchange serving the line of the line circuit, said apparatus including a relay connected to said line and having output contacts connected to the line circuit, and transformer means providing d.c. isolation between line conductors to said exchange and line conductors to said line circuit, said relay comprising a ring winding for detecting ringing current from the exchange to energize said line circuit and a second

winding responsive to line current in the line conductors of said line circuit for holding said line energized.

4,194,094

DEVICE FOR MECHANICALLY RECORDING A SIGNAL HAVING A BANDWIDTH OF SEVERAL MHz, PARTICULARLY FOR A VIDEO DISC

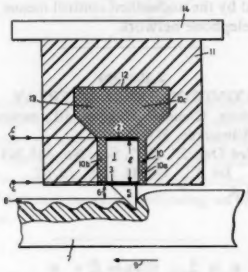
Horst Redlich, Berlin, Fed. Rep. of Germany, assignor to Ted Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec, Switzerland

Filed Nov. 21, 1978, Ser. No. 962,645

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1978, 2752022

Int. Cl.[2] G11B *3/46*; H01L *41/10, 23/14*

U.S. Cl. 179—100.41 P **12 Claims**



1. A device for mechanically recording a signal, having a bandwidth of several MHz on a receiving surface, particularly on a video disc, comprising, a rigid housing having a stylus-receiving cavity, a piezoelectric transducer mounted in said cavity, a cutting stylus connected to said transducer and projecting out of said housing for cutting into the receiving surface, and damping means disposed between said housing and said transducer for resiliently supporting said transducer in said cavity and providing a greater resilience for movement of said transducer in the direction of oscillation than in a direction perpendicular thereto.

4,194,095

FLUID FLOW CONTROL SPEAKER SYSTEM

Toshitada Doi, Yokohama; Akira Iga; Osamu Hamada, both of Tokyo; Jyoji Hukuda, Yokohama, and Yuichiro Hamada, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 765,387, Feb. 3, 1977, abandoned. This application Jan. 6, 1978, Ser. No. 867,508

Claims priority, application Japan, Feb. 10, 1976, 51-13396

Int. Cl.[2] H04R *23/00*

U.S. Cl. 179—113 **11 Claims**

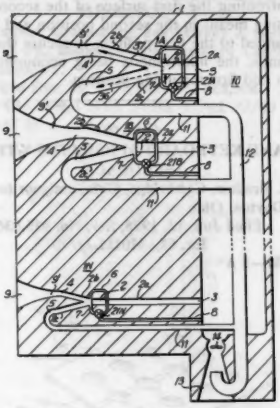
1. A loudspeaker system responsive to a pulse-code modulated input signal having a plurality of bits ranging in order from a most significant bit to a least significant bit, comprising:

a plurality of flow pipes, each associated with a respective order of said bits and each having an inlet and an outlet for producing an acoustic output in response to a predetermined flow condition in the respective flow pipe;

a fluid source for supplying a fluid to each of said inlets;

control means for controlling said flow condition of the fluid through each of said flow pipes; and

circuit means supplied with said pulse-code modulated input signal for actuating said control means of each of said flow



pipes in response to the respective order of said bits of the input signal.

4,194,096

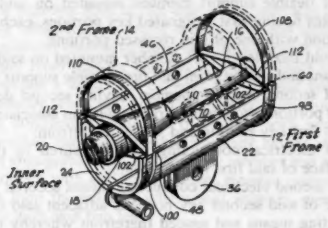
MICROPHONE SHOCK MOUNT AND ASSEMBLY

Robert C. Ramsey, Niles, Mich., assignor to Electro-Voice, Incorporated, Buchanan, Mich.

Filed Nov. 3, 1978, Ser. No. 957,067

Int. Cl.[2] H04R *1/02*

U.S. Cl. 179—147 **10 Claims**



1. A device for mounting a microphone comprising a first frame and a second frame, each of the frames having a first surface extending between opposite ends thereof, each first surface having an elongated recess extending therein between the opposite ends thereof, and each of the frames having a second surface extending between the opposite ends thereof opposite the first surface, two position means for mounting the first frame on the second frame in a first position or a second position, the first surface of the first frame being in abutment with the first surface of the second frame and the elongated recesses of the first and second frames being aligned to form a channel in the first position, and the first surface of the first frame being remote from the first surface of the second frame in the second position, a first and a second closed band of elastomeric material extending about the first frame, one of said first and second bands being disposed adjacent to each end of the first frame and in abutment with the first and second surfaces of the first frame, a third and a fourth closed band of elastomeric material extending about the second frame in spaced relationship, one of said third and fourth bands being disposed adjacent to each end of the second frame and in abutment with the first and second surfaces of the second

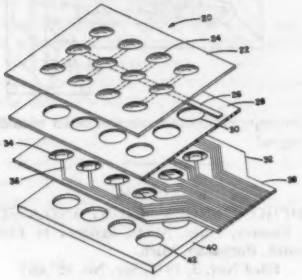
frame, whereby a microphone may be placed between the portion of the first and second bands confronting the first surface of the first frame and the portion of the third and fourth bands confronting the first surface of the second frame with the mounting means in the second position and the mounting means changed to the first position to secure the microphone on the bands, the microphone being accommodated in the channel in said first mounting position.

4,194,097

MEMBRANE KEYBOARD APPARATUS WITH TACTILE FEEDBACK

William R. Bradam, Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 12, 1978, Ser. No. 915,036
Int. Cl.[2] H01H *13/70*
U.S. Cl. 200—5 A **11 Claims**



1. A keyboard apparatus comprising:
support means having a plurality of recessed portions each defining a key portion;
a first flexible support member mounted on said support means having first designated key portions, each in registration with one of said recessed portions;
a second flexible support member mounted on said support means and spaced from said first flexible support member, said second support member having second designated key portions each in registration with an associated one of said first key portion and spaced therefrom;
a first electrical conducting means secured to the inner surface of said first key portion;
and a second electrical conducting means secured to a surface of said second key portions adjacent said first conducting means and spaced therefrom whereby upon depression of a selected one of said first designated key portions, said first and second support members together with their associated electrical conducting means move toward said support member to provide an electrical contact between adjacent electrical conducting means and are further moved into the recessed portion of said support means a distance to provide a tactile feedback with respect to the operation of the key portions.

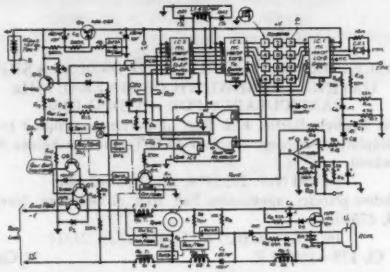
4,194,098

LINEMAN'S HAND TEST SET

Alan J. Carlson, Syosset, N.Y., assignor to Metro-Tel Corp., Syosset, N.Y.

Filed Jun. 12, 1978, Ser. No. 914,869
Int. Cl.[2] H04M *3/22*
U.S. Cl. 179—175 **20 Claims**

1. A lineman's hand test set for generating digital and rotary tones to a telephone network comprising a single tone generating mechanism, a rotary tone encoder, a digital tone encoder, each encoder being operatively connected to the tone generating mechanism, a switch circuit operatively connected to each of said encoders and to the telephone network, generation of tones by said tone generator mechanism pulsing signals to each encoder, control means interposed between each encoder and said switch circuit, the control means being disabled from its particular encoder depending on whether rotary tones or



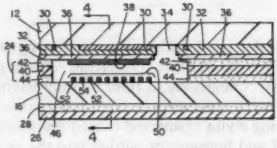
digital tones are desired whereby either rotary tones or digital tones are passed by the undisabled control means to the switch circuit to the telephone network.

4,194,099

CONTROL PANEL OVERLAY

John A. Mickelson, Glendale Heights, Ill., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Oct. 25, 1977, Ser. No. 845,301
Int. Cl.[2] H01H *9/00, 13/02*
U.S. Cl. 200—5 A **12 Claims**



1. A flexible switching element adapted to be mounted on a surface having electrically conductive portions thereon, said element comprising:
a flexible overlay,
said overlay having an upper surface for receiving switch activating pressure and a lower surface,
a layer of ink formed on at least some portions of said overlay lower surface to provide indicia for said switching element,
said overlay being transparent with respect to said indicia, and
an electrically conductive layer formed on at least a portion of said overlay lower surface or ink layer lower surface for movement jointly with a respective indicium and against at least two spaced said electrically conductive portions.

4,194,100

CIRCUIT BREAKER ENCLOSURE

Russell Cox, Frankfort; Joseph C. Drilling, and Harris I. Stanback, both of Lexington, all of Ky., assignors to Square D Company, Palatine, Ill.

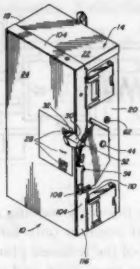
Filed Sep. 19, 1977, Ser. No. 834,219
Int. Cl.[2] H01H *9/22, 9/20*
U.S. Cl. 200—50 A **40 Claims**

1. An enclosure for a circuit interrupting device comprising:
a peripheral wall encircling said device,
a cover carried by said wall for movement between an open and closed position,

a sealing gasket carried by said cover for engaging an end edge of said wall in response to the movement of said cover to said closed position,

a latch element,

means carrying said latch element on said wall for pivotal and longitudinal movement relative said wall to enable said latch element to engage said cover for latching said cover in said closed position,



and bias means for biasing said latch element longitudinally relative said wall for placing said gasket under pressure against said end edge in response to the latching of said cover in said closed position and for pivoting said latch element in response to the disengagement of said latch element from said cover for indicating an open position of said cover.

4,194,101

STARTING BLOCK SWITCH ASSEMBLY FOR TIMED SWIMMING EVENTS

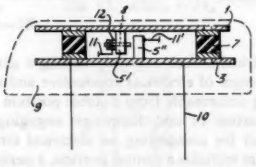
Michel Berseth, La Neuveville, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Switzerland

Filed May 23, 1978, Ser. No. 908,866

Claims priority, application Switzerland, Jun. 1, 1977, 6710/77

Int. Cl.[2] H01H *35/00*; A63K *3/02*

U.S. Cl. 200—52 R **10 Claims**



1. A starting block for timed swimming events comprising:

a fixed support;

a movable platform for supporting a swimmer;

elastic shock absorbing means disposed between said fixed support and said movable platform,

said elastic shock absorbing means supporting said movable platform in a plane while permitting a displacement of the platform having a translational component parallel to said plane under an impetus imparted to the platform by a swimmer;

first contact means mounted on said fixed support; and,

second contact means supported by said movable platform laterally of said first contact means whereby said first and second contact means make contact with each other only upon a displacement of said platform having a translational component parallel to said plane.

4,194,102

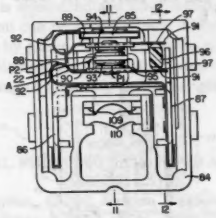
CONDITION RESPONSIVE ELECTRICAL SWITCH CONSTRUCTION AND PARTS AND METHODS THEREFOR

Charles D. Branson, Greensburg, and Harvey J. Shopsky, Latrobe, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 29, 1977, Ser. No. 865,594

Int. Cl.[2] H01H *5/18, 37/38, 37/40, 37/60*

U.S. Cl. 200—67 D **20 Claims**



1. In an electrical switch construction having frame means carrying fixed contact means and movable contact means to be moved relative to said fixed contact means by a knicker-type actuator member, said fixed contact means comprising a single contact member and said movable contact means comprising a pair of movable contact members disposed on opposite sides of said fixed contact member and each being biased in a direction to tend to place the same in contact with said fixed contact member, said actuator member being disposed between said pair of movable contact members and being movable in opposite directions to engage and move the respective movable contact member out of contact with said fixed contact member, the improvement wherein each movable contact member comprises a conductive blade having two legs joined together by a loop at adjacent ends of said legs, one of said legs of each blade being substantially straight and having said loop offset therein at said end thereof to cause that leg to tend to elongate between said fixed contact member and the outside edge of said loop should a weld exist between that leg and said fixed contact member when said actuator member is attempting to move that conductive blade out of contact with said fixed contact member, each said conductive blade having said one leg thereof engageable with said actuator member and adapted to make contact with said fixed contact member intermediate said offset loop thereof and where said actuator member is engageable with said one leg.

11. In a method of making an electrical switch construction having frame means carrying fixed contact means and movable contact means to be moved relative to said fixed contact means by a kicker-type actuator member, said fixed contact means comprising a single contact member and said movable contact means comprising a pair of movable contact members disposed on opposite sides of said fixed contact member and each being biased in a direction to tend to place the same in contact with said fixed contact member, said actuator member being disposed between said pair of movable contact members and being movable in opposite directions to engage and move the respective movable contact member out of contact with said fixed contact member, the improvement comprising the steps of forming each movable contact member to comprise a conductive blade having two legs joined together by a loop at adjacent ends of said legs with one of said legs being substantially straight and having said loop offset therein at said end thereof to cause that leg to tend to elongate between said fixed contact member and the outside edge of said loop should a weld exist between that leg ans said fixed contact member when said actuator member is attempting to move that conductive blade out of contact with said fixed contact member, and forming each said conductive blade to have said one leg thereof engageable with said actuator member and adapted to

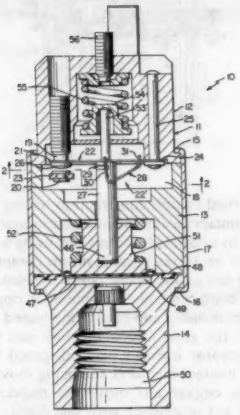
make contact with said fixed contact member intermediate said offset loop thereof and where said actuator member is engageable with said one leg.

4,194,103

ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

William N. Smith, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Sep. 13, 1978, Ser. No. 941,917
Int. Cl.[2] H01H *5/18, 13/36*
U.S. Cl. 200—67 E **20 Claims**



1. In a double throw electrical switch construction having a housing means carrying movable actuator means for moving a snap switch blade of said housing means overcenter to snap a contact portion of said blade between a pair of spaced contact stops carried by said housing means, said actuator means comprising an actuator plunger and an actuator spring, said actuator spring having opposed ends and an intermediate portion between said opposed ends thereof, said actuator spring being movable relative to said housing means and having one of said opposed ends thereof operatively interconnected to said blade to move said blade as said spring is moved, said plunger having lost motion means for acting against said intermediate portion of said actuator spring to cause movement thereof as said actuator plunger is being moved whereby said actuator spring can move relative to said actuator plunger through said lost motion means thereof, the improvement wherein one of said opposed ends of said actuator spring comprises a pair of spaced apart legs, said legs being interconnected together by a narrow band of said actuator spring, said narrow band comprising said intermediate portion of said actuator spring on which said lost motion means of said plunger acts against.

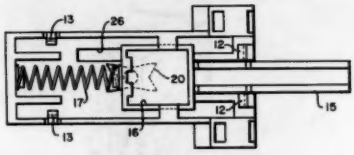
4,194,104

PUSH BUTTON ADAPTER FOR SLIDE SWITCH

Richard A. Stenta, Farmville, Va., assignor to Stackpole Components Company, Raleigh, N.C.

Filed Jan. 31, 1979, Ser. No. 8,067
Int. Cl.[2] H01H *13/56*
U.S. Cl. 200—153 J **6 Claims**

1. The combination with a slide switch having an actuating button extending through a longitudinal slot in the top wall of the switch case, of an adapter for converting the switch into a push button switch, said adapter comprising a housing having an open bottom mounted on top of the switch with said actuating button extending up into the housing, means on the housing attaching it to the switch, a push button plunger slidably mounted in the housing and extending out of one end of it, the plunger having a recess therein loosely receiving said actuating button for moving it with the plunger, a coil spring compressed between the inner end of the plunger and the opposing end wall of the housing for normally holding the plunger in its outermost position with said button at one end of said slot, the plunger being movable into the housing far enough to move said button to the opposite end of said slot, a latch rotatably mounted in the top of the housing above the plunger, and



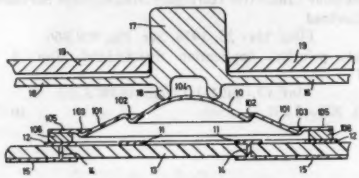
means on top of the inwardly moving plunger for turning the latch from a normal position only far enough for it to stop outward movement of the released plunger before the plunger can move said button away from said opposite end of the slot, said latch-turning means being adapted to turn the latch past said plunger-stopping position when the plunger is pushed inwardly again and to then turn the latch to its normal position when the plunger is released so that the plunger will return said button to said one end of said slot.

4,194,105

SWITCHES

Robert J. Hodges, Cheshunt, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jan. 13, 1977, Ser. No. 759,068
Int. Cl.[2] H01H *13/70*
U.S. Cl. 200—159 B **2 Claims**



1. An electrical switch assembly having a generally dome-shaped diaphragm of electrical conductive and resilient material and being deformable from a stable position to an instable position, a portion of said diaphragm engaging at least one switch contact for completing an electrical circuit, wherein said diaphragm includes a central portion, a peripheral portion and an intermediate frusto-conic portion joining said central and peripherial portions, the transition region between said peripherial portion and said frusto-conic portion is turned away from a first side of the conical surface plane of said frusto-conic portion and the transition region between said central portion and said frusto-conic portion is turned away from the opposite side of said conical surface plane of said frusto-conic portion, one of said transition regions engaging said switch contact for completing said electrical circuit, and the resilient spring characteristics of said diaphragm being controlled by the dimension of said frusto-conic portion between said central and peripherial portions; and means including said one of said transition portions and said switch contact for limiting the deformation translation of said diaphragm in the direction of said instable position thereby to ensure the return translation of said diaphragm back to said stable position.

4,194,106

METHODS AND DEVICES FOR CUTTING, ERODING, WELDING AND DEPOSITING METALLIC AND NON-METALLIC MATERIALS BY MEANS OF AN ELECTRIC ARC

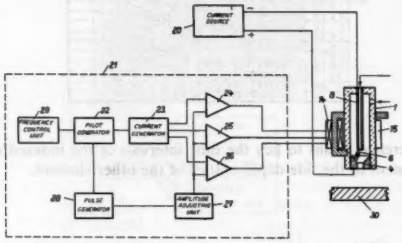
Albi Rudaz, Givrins/VD, and Albert Ferrari, Gland/VD, both of Switzerland, assignors to Secheron Soudure S.A., Gland/VD, Switzerland

Continuation of Ser. No. 652,750, Jan. 27, 1976, abandoned. This application Jun. 6, 1978, Ser. No. 913,061

Claims priority, application Switzerland, Jan. 27, 1975, 919/75

Int. Cl.[2] B23K 9/08

U.S. Cl. 219—123 1 Claim



1. In a device for cutting, eroding, welding or depositing a metallic or non-metallic material by means of an electric arc, first means for producing an electric arc, second means for producing, in the proximity of the arc a turning magnetic field acting on the arc to make it turn, said second means comprising a polyphase alternating current generator for producing said turning magnetic field acting on the arc to make it turn, and third means comprising voltage controlled amplifiers fed by said second means, and a pulse generator for controlling the gain of said amplifiers the output of said voltage controlled amplifiers connected to means for producing said turning magnetic field.

4,194,107

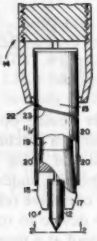
WELDING TIP

George A. Klasson, 4430 Azalea La., North Olmsted, Ohio 44070

Filed Jun. 2, 1977, Ser. No. 802,825

Int. Cl.[2] B23K 9/24

U.S. Cl. 219—75 11 Claims



1. A welding assembly for a TIG welding torch comprising:

an electrode holder; and

an electrode that extends forwardly relative to said torch whereby a welding arc may be established between said electrode and a workpiece for accomplishing a welding operation and which comprises

a solid, highly conductive tip holder with a length of about 1¼" prior to use capable of being removably and releasably mounted in the electrode holder and having a rearward end portion received in the electrode holder and a forward end portion extending outwardly beyond the electrode holder and

a short-length disposable, nonconsumable tungsten electrode tip with a length of about ⅜" prior to use preground to a precise point angle and attached to the forward end portion of the tip holder, the tip being located forwardly of and spaced entirely beyond the forward extension of the electrode holder,

said electrode being located for access externally of said torch whereby the quantity of tungsten utilized in the electrode is minimized and after deterioration of the tip, replacement can be accomplished without disassembly of said torch by placing a new electrode with the preground tip in the electrode holder without requiring in situ cutting and grinding of a new tip from a length of tungsten rod.

4,194,108

THERMAL PRINTING HEAD AND METHOD OF MAKING SAME

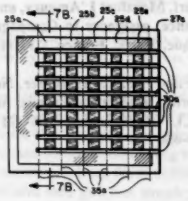
Takashi Nakajima, Chiba; Katsuto Nagano, Yokohama, and Kazumi Ishikawa, Chiba, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jan. 18, 1978, Ser. No. 870,417

Claims priority, application Japan, Jan. 20, 1977, 52/5251

Int. Cl.[2] H05B 1/00

U.S. Cl. 219—216 8 Claims



1. A thermal printing head comprising an electrically insulative substrate, a pattern of heat generating elements formed on a surface of said substrate and electrically insulated from one another, and means for selectively flowing an electric current to said heat generating elements to heat selected ones of the elements, said heat generating elements consisting substantially of a boron phosphide compound.

4,194,109

FOOD SERVING TRAY AND SUPPORTING HEATER SHELF

Donald A. Springer, San Jose, Calif., assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

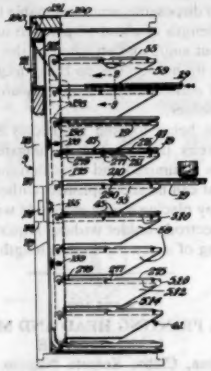
Division of Ser. No. 758,455, Jan. 11, 1977. This application Oct. 4, 1977, Ser. No. 839,379

Int. Cl.[2] H05B 1/00

U.S. Cl. 219—386 21 Claims

1. In combination a heater shelf rack and heater shelves and food serving trays, said rack including a plurality of sets of cantilevered support arms, each of said support arms including an upper edge and a depending side wall having a lower horizontal edge, each of said heater shelves being mounted to a corresponding set of said support arms, each of said heater shelves including a generally flat upper surface with at least one heater element thereon, each of said food serving trays including a generally flat upper surface, a raised border on at least the lead edge of each tray, a pair of notches in said raised border of said lead edge, said notches being spaced apart by the same distance as the distance between the lower horizontal edges of said support arms, each tray including at least one dish supporting opening for being disposed over said heater ele-

ment, and each tray being supported by one of said heater shelves with the lower edges of the adjacent support arms



above said heater shelf being disposed directly above said notches.

4,194,110

LOCALIZED-FIELD STATIC MAGNETIZING DEVICE

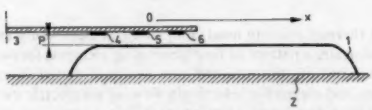
Jean P. Lazzari, Montfort L'Amaury, and Michel Helle, Marcq, both of France, assignors to Compagnie Internationale pour l'Informatique, Paris, France C11-Honeywell Bull (Societe Anonyme),

Filed Feb. 23, 1978, Ser. No. 880,331

Claims priority, application France, Mar. 31, 1977, 77 09823

Int. Cl.[2] **G06K** *7/08, 19/06;* **G11B** *5/09, 5/02*

U.S. Cl. 235—450 **21 Claims**



1. A localized-field static magnetizing device comprising a substrate, a magnetic magnetizing layer on said substrate, said magnetic layer having a succession of adjoining zones in which the magnetic induction is alternately positive and negative, said zones being alternately of different lengths d1 and d2, the length of each d1 zone being the same for all such zones, the length of each d2 zone being the same for all such zones, the length of each d2 zone being the same for all such zones, the length d2 being very much greater than the length d1.

4,194,111

TIDAL DEPTH CALCULATOR

Joseph Katz, 529 Main St., Box 69, Stoneham, Mass. 02180

Filed Oct. 25, 1978, Ser. No. 954,594

Int. Cl.[2] **G06C** *3/00, 27/00*

U.S. Cl. 235—83 **15 Claims**

1. A tidal depth calculator device of the slide rule type comprising: a sliding element and a stationary element, said elements being connected for relative motion therebetween; one of said elements having indicia thereon representative of sequential time intervals spanning at least a twelve hour period; the other of said elements having thereon a tidal range table comprising a list of tidal ranges and a table of tide depths comprising a plurality of tidal depth entries keyed to each tidal range of said list, said entries being arranged in sequential time interval order embracing a tide cycle; means to index the one element to the other element, thereby to key the time interval indicia of the one element representing the starting time of a tidal cycle to said tidal range table of the other element; and

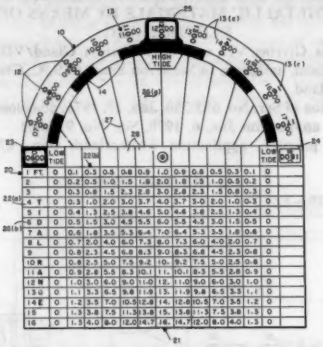


CHART LOW TIDE		2238				⊕						LOW TIDE	2231
1 FT.	0	0.1	0.3	0.5	0.8	0.9	1.0	0.9	0.8	0.5	0.3	0.1	0
2	0	0.2	0.5	1.0	1.5	1.8	2.0	1.8	1.5	1.0	0.5	0.2	0
3	0	0.3	0.8	1.5	2.3	2.8	3.0	2.8	2.3	1.5	0.8	0.3	0
4 T	0	0.3	1.0	2.0	3.0	3.7	4.0	3.7	3.0	2.0	1.0	0.3	0
5 I	0	0.4	1.3	2.5	3.8	4.6	5.0	4.6	3.8	2.5	1.3	0.4	0
6 D	0	0.5	1.5	3.0	4.5	5.5	6.0	5.5	4.5	3.0	1.5	0.5	0
7 A	0	0.6	1.8	3.5	5.3	6.4	7.0	6.4	5.3	3.5	1.8	0.6	0
8 L	0	0.7	2.0	4.0	6.0	7.3	8.0	7.3	6.0	4.0	2.0	0.7	0
9	0	0.8	2.3	4.5	6.8	8.3	9.0	8.3	6.8	4.5	2.3	0.8	0
10 R	0	0.8	2.5	5.0	7.5	9.2	10.	9.2	7.5	5.0	2.5	0.8	0
11 A	0	0.9	2.8	5.5	8.3	10.1	11.	10.1	8.3	5.5	2.8	0.9	0
12 N	0	1.0	3.0	6.0	9.0	11.0	12.	11.0	9.0	6.0	3.0	1.0	0
13 G	0	1.1	3.3	6.5	9.8	11.9	13.	11.9	9.8	6.5	3.3	1.1	0
14 E	0	1.2	3.5	7.0	10.5	12.8	14.	12.8	10.5	7.0	3.5	1.2	0
15	0	1.3	3.8	7.5	11.3	13.8	15.	13.8	11.3	7.5	3.8	1.3	0
16	0	1.3	4.0	8.0	12.0	14.7	16.	14.7	12.0	8.0	4.0	1.3	0

reference means to key the time intervals of the indexed one element to the tide depth entries of the other element.

4,194,112

PRESETTING COUNTER DEVICE

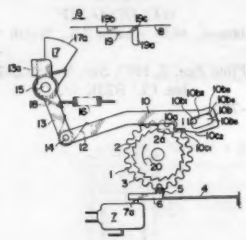
Hiromi Mori, Aichi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 2, 1979, Ser. No. 26,344

Claims priority, application Japan, Apr. 13, 1978, 53/49275[U]

Int. Cl.[2] **G06F** *15/18;* **G06M** *1/00*

U.S. Cl. 235—132 E **5 Claims**

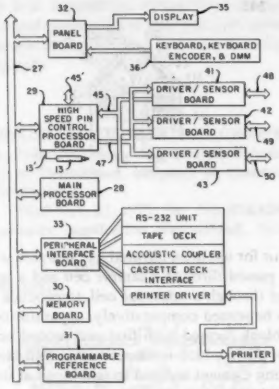


1. A presetting counter device operable by a cyclically movable device, comprising, a ratchet wheel coupled to a cycle number setting dial and being rotatable stepwise for reducing the setting of the dial, indexing means engageable with the ratchet wheel in operative relation to the movement of the cyclically movable device to rotate the ratchet wheel stepwise by one pitch thereof at a time, means for generating cycle repeating signals, a member coupled to the ratchet wheel for movement therewith, said member including a signal generating means actuating portion having the same pitch angle as the ratchet wheel, the actuating portion engaging the signal generating means for actuating same, and the indexing means including a means for temporarily stopping the ratchet wheel in the course of its stepwise rotation at a position where the signal generating means is held actuated by the actuating member.

4,194,113
METHOD AND APPARATUS FOR ISOLATING FAULTS IN A LOGIC CIRCUIT

Robert G. Fulks; Robert E. Enfield, and Eric Sacher, all of Phoenix, Ariz., assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 13, 1978, Ser. No. 895,892
Int. Cl.[2] G06F *11/00*; G01R *31/28*
U.S. Cl. 371—20 61 Claims



1. A method for isolating faults in a loop of a digital circuit, the loop including a plurality of nodes, the method comprising the steps of:

(a) for each node in the loop

i. applying a predetermined sequence of test signals to an input of the digital circuit;

ii. comparing a response of the node to the known correct response of the node to determine if the node response is faulty;

iii. if the node response is faulty, storing information representative of a time of occurrence of the earlier of an actual initial transition of the node and a known correct initial transition of the node;

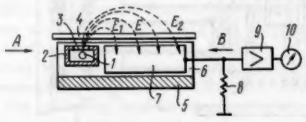
(b) testing loop entry nodes of the loop to determine if the response of any loop entry node is faulty until a loop entry node having a faulty response is determined; and

(c) if none of the loop entry nodes are faulty, determining which node corresponds to the earliest of said stored information representative of said initial transitions.

4,194,114
DEVICE FOR NON-CONTACT GAUGING OF THICKNESS OR WEIGHT PER UNIT AREA OF SHEET AND LIKE MATERIALS

Vladimir I. Pankratov; Gennady P. Konovalenko; Ivan T. Prilipko, and Moris L. Gomberg, all of Kiev, U.S.S.R., assignors to Ukrainsky Nauchno-Issledovatelsky Institut Tselljulozno-Bumazhoi Promyshlennosti (UKRNIIB), U.S.S.R.

Filed Jan. 3, 1978, Ser. No. 866,811
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—308 4 Claims

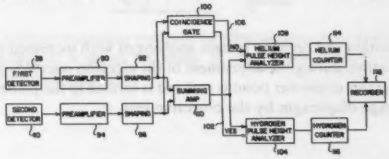


1. A device for non-contact gauging of thickness or weight per unit area of sheet materials, comprising radiation source means for producing charged ionizing radiation located on one side of the material, magnetic means including at least one pair of magnetic poles for arcuately deflecting the radiation that has passed through the material to enable it to pass through the same material in a reverse direction, a radiation detector to perceive the radiation that has passed through the material in the reverse direction, said detector being located on the same side of the material as said radiation source means, said radiation source means and said radiation detector being interposed between the poles of said magnetic means.

4,194,115
METHOD AND MEANS FOR HELIUM/HYDROGEN RATIO MEASUREMENT BY ALPHA SCATTERING

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; A. Bruce Whitehead, Wayzata, Minn., and Thomas A. Tombrello, Altadena, Calif.

Filed Nov. 7, 1978, Ser. No. 958,573
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—308 10 Claims



1. An apparatus for providing data useful in a determination of the ratio of helium to hydrogen in a gaseous sample; comprising:

a source for directing alpha particles into said gaseous sample;

isolation means for isolating scattering products contained within a predetermined forward scattering angular range, said scattering products resulting from collisions between said alpha particles and said gaseous simple;

detection means for detecting said isolated scattering products;

first identification means for identifying said detected isolated scattering products resulting from alpha particle/hydrogen collisions; and

second identification means for identifying said detected isolated scattering products resulting from alpha particle/-helium collisions whereby the ratio of helium to hydrogen is determinable from the ratio of the products of said second and first identification means, respectively.

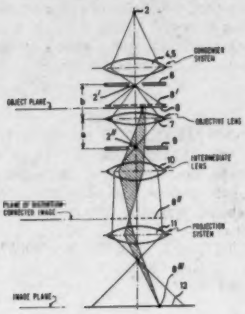
4,194,116
ELECTRON MICROSCOPE OR THE LIKE AND METHOD OF USE

Wilhelm Egle, Königsbronn, Fed. Rep. of Germany, assignor to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Sep. 18, 1978, Ser. No. 943,579
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2742264
Int. Cl.[2] G01M *23/00*
U.S. Cl. 250—311 12 Claims

1. A method of reproducing the image of an object with low magnification by means of a corpuscular radiation device, in particular an electron microscope, in which the object, whose position remains the same regardless of the magnification chosen, is illuminated by a condenser system behind which is a condenser diaphragm, and in which the final image is produced on a screen by means of an objective lens, an intermediate lens, and a projection system, as well as an image diaphragm (zone diaphragm) placed between the objective and intermediate lenses, distinguished in that the objective lens is switched on and is given a low level of excitation enabling it to form, together with the intermediate lens, an optimum, distortion-corrected image of the object in the object plane of the

following projection system, and that the condenser system is excited such that the crossover point of the rays emitted by the radiation source is between the object and the last condenser lens in or near the plane of the condenser diaphragm, whose



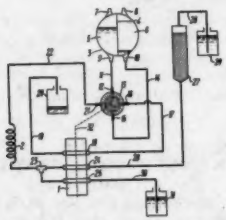
position and opening remain unchanged with increased magnification, during the adjustment of the electron microscope, and that this crossover point is real and is formed in the plane of the image diaphragm by the objective lens.

4,194,117

ARRANGEMENT FOR CONTINUOUSLY MEASURING THE RADIOACTIVITY OF SOLUTIONS OF MATTERS IN A HOMOGENEOUS MIXTURE WITH A LIQUID SCINTILLATOR

Valery N. Gross, ulitsa Poddubnogo 6, Alma-Ata, U.S.S.R.

Filed Aug. 22, 1977, Ser. No. 826,663
Int. Cl.[2] G01T *1/00*
U.S. Cl. 250—328 **1 Claim**



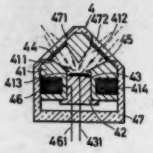
1. An arrangement for continuously measuring the radioactivity of solutions of matters in a homogeneous mixture with a liquid scintillator, comprising: a multi-channel pump for feeding the solution of a matter, the liquid scintillator and their mixture, a device for mixing the solution of a matter with the liquid scintillator and for obtaining a homogeneous mixture thereof: a first measuring chamber; a second measuring chamber; a system of conduits: a two-way tap valve having two operating positions; said two-way tap valve serving, when in the first position thereof, to establish communication between said first measuring chamber and said mixing device, and between said second measuring chamber and said multi-channel pump, and also serving, when in the second position thereof, to establish communication between said first measuring chamber and said multi-channel pump, and between said second measuring chamber and said mixing device.

4,194,118

DETECTOR FOR USE IN INFRARED GAS ANALYZER

Mitsuo Kotaka; Hirotoshi Ishikawa; Kaisuke Muraki; Ryo Takahashi, and Tamizo Matsuura, all of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Mar. 20, 1978, Ser. No. 888,408
Claims priority, application Japan, Mar. 30, 1977, 52/38864; Apr. 1, 1977, 52/40383; Sep. 19, 1977, 52/125773
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—343 **2 Claims**



1. A detector for use in an infrared gas analyzer wherein one light beam is passed through a sample cell and a second light beam is passed through a reference cell, to produce two resultant beams to be sensed comparatively, apparatus comprising:

a metallic block formed with first and second cone-shaped light inlet ports which intersect within said block;

a light sensing element secured to said block at the intersection of said two ports;

multilayer interference filters secured to said block and covering the entrances to said light inlet ports, said filters being positioned to be at right angles to incoming light beams;

temperature control means including first circuit means coupled to said light sensing element and responsive to variations in temperature thereof to regulate the temperature of said metallic block to tend to maintain a constant block temperature; and

signal detecting means including second circuit means coupled to said light sensing element and responsive to variations in light impinging thereon to produce a corresponding measurement signal;

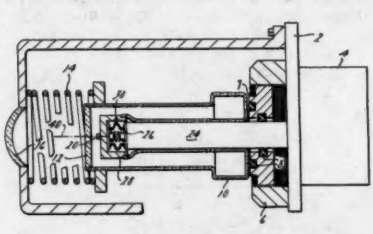
whereby a measurement signal relating to the density of the gas in said sample cell may be obtained by alternately directing said two resultant beams to said two light ports respectively.

4,194,119

SELF-ADJUSTING CRYOGENIC THERMAL INTERFACE ASSEMBLY

Ronald MacKenzie, Newport Beach, Calif., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 30, 1977, Ser. No. 855,844
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—352 **10 Claims**



1. A compressible thermal interface assembly for providing a predetermined heat conducting path between a reorientable

heat source having a flat surface and a relatively fixed heat sink having a flat surface comprising:

a first heat conducting plate for intimately contacting said flat surface of said reorientable heat source;

a second heat conducting plate for intimately contacting said flat surface of said relatively fixed heat sink;

a compressed spring element centrally located between said plates to bias said plates in intimate contact with said source and said sink; and

a flexible heat conducting means surrounding said spring element and connected to said first and second heat conducting plates for defining said predetermined heat conducting path.

4,194,120

ADJUSTABLE IONIZATION CHAMBER

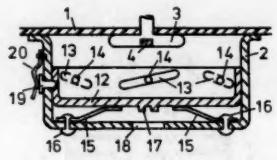
Otto Meier, Hombrechtikon, and Andreas Scheidweiler, Uerikon, both of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Nov. 21, 1977, Ser. No. 853,434

Claims priority, application Switzerland, Nov. 29, 1976, 15006/76

Int. Cl.² H01J *39/28*

U.S. Cl. 250—381 **13 Claims**



1. An ionization chamber with two electrodes having a variable spacing, with a radioactive source for the ionization of the electrode gap therebetween, and with an adjusting mechanism for the positional adjustment of one of the electrodes relative to the other being constructed and positioned in such a way that a spring element presses the adjustable electrode against at least one point of the adjusting mechanism, wherein the adjustable electrode is constructed in cup-shaped manner and has a flat base and cylindrical sides in which guide slots are provided into which extend fixed pins and wherein the cup-shaped electrode rotates about its axis.

4,194,121

METHOD AND APPARATUS FOR PROVIDING SIMULTANEOUS DISPLAYS IN PANORAMIC RADIOGRAPHY

Robert H. Cushman, Princeton, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 13, 1978, Ser. No. 969,042

Int. Cl.² G03B *41/16*

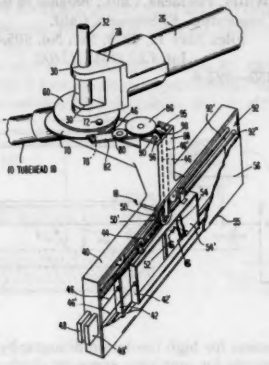
U.S. Cl. 250—439 P **5 Claims**

1. A process for providing a plurality of simultaneous panoramic displays of different portions of focal trough of dental arch area of a patient by means of a tubehead-camera assembly continuously orbiting about said patient, said process comprising

irradiating said dental arch area of said patient with radiation from an X-ray source within said orbiting tubehead to produce intelligence carrying radiation,

directing said intelligence carrying radiation while said tubehead and camera are orbiting about said patient onto a first recording medium moving within said orbiting camera at a predetermined speed,

permitting said radiation directed onto said first recording medium to activate said first recording medium before substantially passing therethrough for activating a second recording medium immediately rearwardly said first recording medium,



said second recording medium moving within said orbiting camera at a speed dissimilar to said speed of said first recording medium.

4,194,122

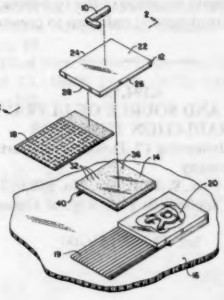
APPARATUS FOR THE MARKING OF X-RAY FILM

Eugene C. Mitchell, and Carol J. Mitchell, both of 538 N. Maryland, #2, Glendale, Calif. 91206, assignors to Eugene Mitchell, Santa Monica, Calif.

Filed Jun. 7, 1978, Ser. No. 913,408

Int. Cl.² G03B *41/16*; F16B *47/00*

U.S. Cl. 250—476 **14 Claims**



1. A device for marking X-ray film with identifying characters, the film being held prior to exposure in a cassette of non-X-ray shielding material, said device comprising:

indicia of X-ray shielding material;

means rigidly secured to said indicia for supporting said indicia;

means for releasably securing said supporting means and therewith said indicia to the cassette; and

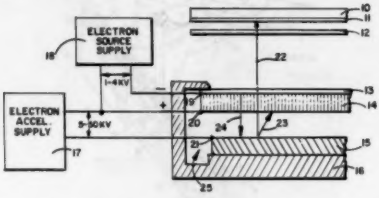
a generally flexible tab connected to said supporting means and extending outwardly therefrom for facilitating the removal of said supporting means and therewith said indicia from the cassette.

4,194,123

LITHOGRAPHIC APPARATUS

David B. Wittry, Pasadena, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 12, 1978, Ser. No. 905,484
Int. Cl.[2] H01J *37/00*
U.S. Cl. 250—492 A 13 Claims



1. Apparatus for high resolution lithography comprising,
source means for supplying energetic charged particles,
microchannel array plate means for collimating said charged particles into a prescribed beam path,
said source means comprising a layer on said microchannel array plate,
mask means, and
utility means disposed to receive and be responsive to energy produced by said charged particles which pass through said mask means as part of said beam path.

4,194,124

METHOD OF PREVENTING VAPOR EXPLOSIONS CAUSED BY CONTACT OF TWO LIQUIDS HAVING DIFFERENT TEMPERATURES

Hugh Nutley, 827 W. Barrett, Seattle, Wash. 98119, and Howard S. Gardner, 5743 NE. 56th, Seattle, Wash. 98105

Filed Oct. 11, 1977, Ser. No. 840,756
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—492 R 9 Claims

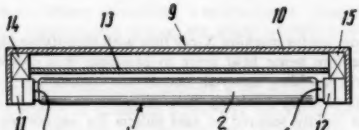
1. A method of preventing vapor explosions caused by contact of two liquids having different temperatures comprising:
irradiating the liquid interface of the two-liquid system with sufficient electromagnetic radiation to prevent such vapor explosions.

4,194,125

SUNLAMP AND SOURCE OF ULTRAVIOLET RADIATION THEREFOR

Friedrich Wolff, Lindenring 17, D-6000 Frankfurt am Main 50, Fed. Rep. of Germany

Filed Nov. 8, 1978, Ser. No. 958,613
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1978, 2844967
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—504 7 Claims



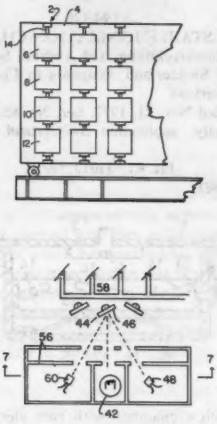
4. A sunlamp, comprising a housing; spaced-apart aligned first and second sockets mounted in said housing; and a source of ultraviolet light, particularly in the UVA region, including a hollow elongated tubular body having first and second end portions and an outer diameter of approximately 25 mm, first and second plugs respectively provided at said first and second end portions, the combined length of said tubular body and said plugs being between 440 and 450 mm, and electric contact means extending from each of said plugs and removably received in the respective sockets.

4,194,126

ESCORT MEMORY USING MIRRORS

Jacob Rabinow, Bethesda, Md., assignor to Hall & Myers, Potomac, Md., a part interest

Filed Mar. 6, 1978, Ser. No. 884,349
Int. Cl.[2] G06K *7/10*
U.S. Cl. 250—566 9 Claims



1. In a machine for sorting articles by selectively delivering them to a multiplicity of destinations, a conveyor including a series of article storage devices for respectively receiving articles to be sorted, a source of light, light beam reflecting means responsive to said source and associated with each article storage device for producing light beams which represent a coded address for the destination of the article associated with its complementary article storage device, and means, for each of a multiplicity of destinations, responsive to light beams from said light beam reflecting means for determining when a given article storage device has reached its proper destination as determined by said coded address;
said light beam reflecting means associated with each article storage device having mirrors each independently selectively settable to one of only two positions to reflect the light to form beams that collectively represent the address in the binary code.

4,194,127

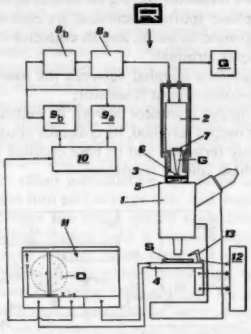
PROCESS AND DEVICE FOR CHECKING SUBSTRATE WAFERS

Walter Schmidt, Lenzburg, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 755,135, Dec. 29, 1976, abandoned. This application Mar. 17, 1978, Ser. No. 887,516
Claims priority, application Switzerland, Jan. 20, 1976, 625/76
Int. Cl.[2] G01N *21/32*
U.S. Cl. 250—572 21 Claims

1. A method for determining the number and distribution of defects in substrate wafers, particularly polished wafers of single crystal materials comprising:

moving said wafer in two dimensions;
projecting light on said wafer;
conducting light reflected by said wafer to a photosensor;
sensing the intensities of said light reflected by said wafer;
transforming the differences of said sensed light intensities into an electrical signal;



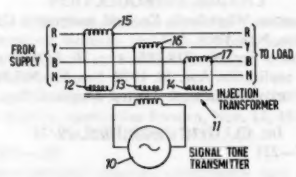
feeding said signal to an indicating element responsive to the strength of said electrical signal; and
moving said indicating element in synchronism with said wafer whereby the number and distribution of defects on said wafer are displayed by said indicating element.

4,194,128

RIPPLE CONTROL SYSTEMS

Timothy J. Biglin, Bath, England, assignor to The Horstmann Gear Company Limited, Avon, England

Filed Jul. 26, 1977, Ser. No. 819,225
Claims priority, application United Kingdom, Jul. 27, 1976, 31298/76
Int. Cl.[2] H02J *13/00*; H04B *3/56*
U.S. Cl. 307—3 **6 Claims**



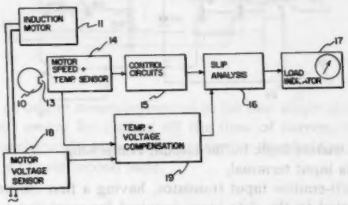
1. A three phase ripple control system for feeding a control signal onto each phase line, the system comprising an injection transformer having a primary winding and three secondary windings a control signal generator connected in circuit with said primary winding and a respective inductor connected in series in each phase line which inductors are each coupled in parallel with a respective one of said secondary windings for receiving a common control signal the inductors having a value of inductance arranged such that their impedance at line frequency is substantially smaller than the magnetising impedance of the transformer.

4,194,129

ARMATURE SLIP ANALYSIS OF INDUCTION MOTORS WITH TEMPERATURE AND VOLTAGE CORRECTION

Robert F. Dumbeck, Elgin, Tex., assignor to Rexnord Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 675,780, Apr. 12, 1976, Pat. No. 4,063,112, which is a continuation-in-part of Ser. No. 548,011, Feb. 7, 1975, abandoned. This application Dec. 8, 1977, Ser. No. 858,674
Int. Cl.[2] H02K *11/00*
U.S. Cl. 307—149 **6 Claims**



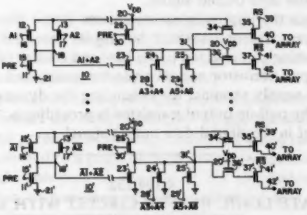
1. A load indication system for displaying a load signal of an induction motor, comprising in combination means for measuring armature slip from electric pulses derived from motor shaft rotation speed, means responsive to motor temperature to produce a temperature correction signal, means for producing a load display signal derived from joint action of the pulses and the temperature correction signal thereby improving the accuracy of said display signal due to variations of motor operating temperature, means for applying voltage to operate said motor, means coupled thereto for sensing variations of said voltage and producing a signal that is a measure of said voltage variations, and means responsive to the voltage variation signal further modifying the load display signal in response to variations of motor operating voltage.

4,194,130

DIGITAL PREDECODING SYSTEM

Jerry D. Moench, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 21, 1977, Ser. No. 853,786
Int. Cl.[2] H03K *19/08, 19/20*; G11C *8/00*
U.S. Cl. 307—205 **6 Claims**



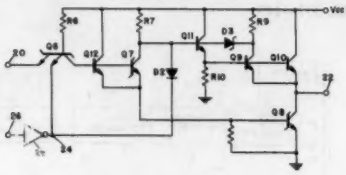
1. A circuit for providing address signals to a memory array, comprising: a plurality of OR gates for predecoding a first portion of an address signal received in a coded format; a plurality of NOR gates each coupled to a respective one of the plurality of OR gates, the plurality of NOR gates providing at least one output; and a plurality of means each coupled to one of the plurality of NOR gates, each of the plurality of means for ANDing the at least one output with a signal to route a decoded address signal to a predetermined line of storage cells within the memory array.

4,194,131

TRISTATE LOGIC BUFFER CIRCUIT WITH ENHANCED DYNAMIC RESPONSE

Dale A. Mrazek, Los Altos Hills, and Robert M. Reinschmidt, Sunnyvale, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 30, 1978, Ser. No. 910,383
Int. Cl.[2] H03K *3/29, 19/08*
U.S. Cl. 307—209 **2 Claims**



1. A tristate logic buffer circuit, comprising
a data input terminal;
a multi-emitter input transistor, having a first emitter connected to the data input terminal for receiving a digital data input signal;
a voltage supply terminal;
a phase splitter transistor having its base coupled to the collector of the input transistor;
a data output terminal;
a pull-down output transistor having its base coupled to the emitter of the phase splitter transistor, its emitter coupled to a circuit ground terminal, and its collector connected to the data output terminal;
a pull-up output transistor having its emitter connected to the data output terminal and its base coupled to the collector of the phase splitter transistor;
a resistance for coupling the collector of the pull-up output transistor to the voltage supply terminal;
a circuit disable terminal connected to a second emitter of the input transistor; and
a diode having its anode connected to the collector of the phase splitter transistor and its cathode connected to the circuit disable terminal;
wherein, when a "high" logic signal is applied at the circuit disable terminal, a digital data output signal that is the logical complement of the digital data input signal is provided at the data output terminal; and when a "low" logic signal is applied at the circuit disable terminal, the circuit has a high output impedance between the data output terminal and circuit ground to inhibit the provision of said digital data output signal;
wherein the improvement comprises
a current mirror transistor having its base and emitter respectively connected to the base and emitter of the pull-up output transistor and its collector connected to the voltage supply terminal for enhancing the dynamic response of the pull-up output transistor in providing a "high" logic level in the digital data output signal.

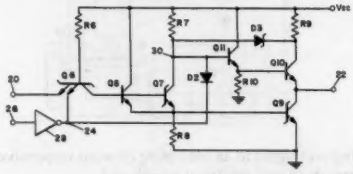
4,194,132

TRISTATE LOGIC BUFFER CIRCUIT WITH REDUCED POWER CONSUMPTION

Dale A. Mrazek, Los Altos Hills, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 30, 1978, Ser. No. 910,384
Int. Cl.[2] H03K *3/29, 19/08*
U.S. Cl. 307—209 **6 Claims**

1. A tristate logic buffer circuit, comprising
a data input terminal;
a multi-emitter input transistor, having a first emitter connected to the data input terminal for receiving a digital data input signal;
a voltage supply terminal
a first resistance for coupling the base of the input transistor to the voltage supply terminal;
a phase splitter transistor having its base coupled to the collector of the input transistor;
a second resistance for coupling the collector of the phase splitter transistor to the voltage supply terminal;
a data output terminal;
a pull-down transistor having its base coupled to the emitter of the phase splitter transistor, its emitter coupled to a circuit ground terminal, and its collector connected to the data output terminal;
a third resistance coupled between the base and emitter of the pull-down output transistor;
a pull-up output transistor having its emitter connected to the data output terminal, its collector coupled to the voltage supply terminal, and its base coupled to the collector of the phase splitter transistor;



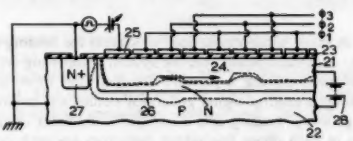
a circuit disable terminal connected to a second emitter of the input transistor; and
a diode having its anode connected to the collector of the phase splitter transistor and its cathode connected to the circuit disable terminal;
wherein, when a "high" logic signal is applied at the circuit disable terminal, a digital data output signal that is the logical complement of the digital data input signal is provided at the data output terminal; and when a "low" logic signal is applied at the circuit disable terminal the circuit has a high output impedance between the data output terminal and circuit ground to inhibit the provision of said digital data output signal;
wherein the improvement comprises
a current mirror transistor having its base and emitter respectively connected to the base and emitter of the phase splitter transistor and its collector connected to the voltage supply terminal.

4,194,133

CHARGE COUPLED CIRCUIT ARRANGEMENTS AND DEVICES HAVING CONTROLLED PUNCH-THROUGH CHARGE INTRODUCTION

John M. Shannon, Whyteleafe, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 718,885, Aug. 30, 1976, abandoned.
This application Apr. 28, 1978, Ser. No. 900,910
Claims priority, application United Kingdom, Sep. 5, 1975, 36701/75
Int. Cl.[2] G11C *19/28*; H01L *29/78*
U.S. Cl. 307—221 D **4 Claims**



1. A charge coupled circuit arrangement comprising a charge coupled device having a semiconductor body comprising a region of one conductivity type in which charge carriers representative of information can be stored at a plurality of

storage sites and transferred between successive storage sites from a first part of the region to a second part of the region, an input gate electrode for converting signal information into said charge carriers, a storage site associated with the input gate electrode, an insulating layer which separates the input gate electrode from the first part of the region, a further region in the semiconductor body which forms a source of charge carriers to be stored and transported, said source region being separated from the storage site associated with the input gate electrode by at least one rectifying barrier bounding said source region and having a zero-bias small depletion region, drive circuit means connected to the device for effecting the transfer of charge between storage sites, and input circuit means including connections to the input gate electrode and source region for converting signal information into an input of charge into the storage site associated with the input gate electrode by causing a depletion region which is formed at least in part adjacent said storage site to punch-through to the source region to effect introduction of charge carriers from said source region into said storage site, said depletion region adjacent said storage site being spaced apart from said zero-bias small depletion region until it reaches equilibrium, the transport of charge carriers being arranged to occur via the interior of the region of one conductivity type, said region at least during operation being isolated from the surroundings thereof, the source region being of the same conductivity type as said region in which charge storage and transport is effected and being separated therefrom by a region of the opposite conductivity type, the semiconductor body region of one conductivity type comprising a surface layer of one conductivity type, said surface layer having a thickness and doping concentration such that a depletion region can be obtained throughout the thickness of the surface layer by means of an electric field while avoiding breakdown, an electrode system at at least one side of the surface layer for the capacitive production of electric fields in the surface layer by means of which charge can be transported from a first part of the surface layer to a second part of the surface layer in the lateral direction of the surface layer via the interior of the surface layer, said input gate electrode being separated from the first part of the surface layer by said insulating layer, said surface layer of the one conductivity type being laterally bounded in the semiconductor body at least in the vicinity of the location of the input gate electrode by a region of the opposite conductivity type, said region of the opposite conductivity type separating the first part of the surface layer from a surface region of the one conductivity type which forms the source region, and ohmic connections at least to the source region and to the region of the opposite conductivity type.

4,194,134

TWO-TERMINAL NETWORK COMPRISING A TRANSISTOR

Fritz L. G. Bjorklund, Tyreso; Carl-Olof Sandberg, Handen; Olaf Sternbeck, Bromma, and Lars A. Wern, Stockholm, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

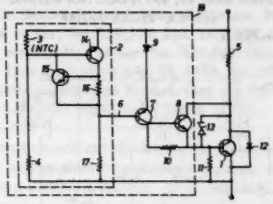
Filed Nov. 3, 1977, Ser. No. 848,314

Claims priority, application Sweden, Nov. 12, 1976, 7612698

Int. Cl.[2] H03K *17/00, 3/26*

U.S. Cl. 307—255 **4 Claims**

1. A two-terminal network comprising: first and second terminals; a transistor means having base, emitter and collector electrodes for switching from a low-ohmic state to a high-ohmic state in accordance with the presence or absence of current through the base electrodes; means for connecting said emitter electrode to one of said terminals; means for connecting said collector electrode to the other of said terminals; a shunt diode connected across the emitter and collector electrodes of said transistor means; a zener diode connected across the collector and base electrodes of said transistor means; and a regenerative threshold switching device connected across said first and second terminals, said regenerative threshold switching device having an input means responsive to the potential across said terminals for switching said regenerative threshold switching device from a first state to a second state when the potential across said terminals exceeds a predetermined value, and said regenerative threshold switching device



having an output means connected to the base electrode of said transistor means for cutting off the flow of current through said base electrode when said regenerative threshold switching device is in said second state.

4,194,135

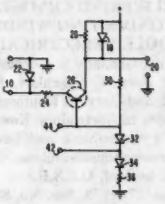
ELECTRONIC SIGNAL LEVEL TRANSLATING CIRCUITRY

Warren A. Christopherson, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1978, Ser. No. 921,144

Int. Cl.[2] H03K *5/00*

U.S. Cl. 307—260 **10 Claims**



1. Electronic signal level translating circuitry, comprising

a transistor having emitter, collector and base electrodes,

an output circuit including a load resistor connected to the collector electrode of said transistor,

an input circuit including an input resistor connected solely to but one of the other electrodes of said transistor,

a reference potential regulating circuit including one terminal connected to a point of fixed energizing potential, one terminal connected to another of the electrodes of said transistor, and another terminal connected to a point of fixed reference potential,

said reference circuit comprising at least two diodes and at least two resistors of equal value connected in series between said points of fixed potential with said other electrode of said transistor connected to the junction between one of said diodes and one of said resistors having one terminal thereof connected to said point of fixed energizing potential, and

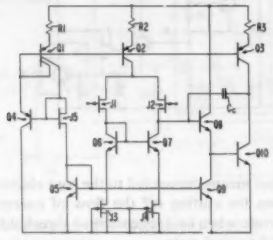
the p-n junctions of each of said diodes having the same characteristics as that of the emitter-base p-n junction of said transistor.

4,194,136

INPUT STAGE USING JUNCTION FIELD EFFECT TRANSISTORS FOR BIASING

James R. Butler, San Jose, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Jun. 17, 1977, Ser. No. 807,602
Int. Cl.[2] H03K 17/00
U.S. Cl. 307—296 R 3 Claims



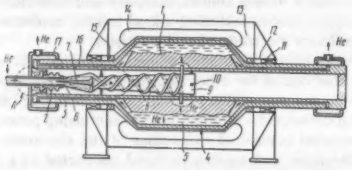
1. A bias circuit comprising:
at least a pair of bipolar transistors, the bases of said pair of bipolar transistors being connected to each other;
a first junction field effect transistor, the source of which is connected to the emitter of one of said pair of bipolar transistors; and
a second junction field effect transistor, the source of which is connected to the emitter of the other of said pair of bipolar transistors;
wherein the gate electrodes of said first and second junction field effect transistors are connected to each other and to the drain electrodes of both said first and second junction field effect transistors.

4,194,137

DEVICE FOR DELIVERING CRYOGEN TO ROTARY SUPER-CONDUCTING WINDING OF CRYOGEN-COOLED ELECTRICAL MACHINE

Alexandr A. Vinokurov; Gennady S. Gorbunov; Jury S. Popov, all of Novosibirsk; Jury V. Skachkov, Leningrad; Iosif F. Filippov, Leningrad, and Gary M. Khutoretsky, Leningrad, all of U.S.S.R., assignors to Spetsialnoe Konstruktorskoe Bjuro "Energokhimmash", Novosibirsk and Leningradskoe Proizvodstvennoe Elektromashinostroitelnoe Obiedinenie "Elektrosila", Leningrad, both of, U.S.S.R.

Filed Mar. 17, 1978, Ser. No. 887,533
Int. Cl.[2] H02K 9/00
U.S. Cl. 310—52 6 Claims



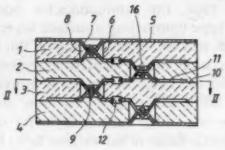
1. A cryogen-cooled electrical machine comprising:
a stator;
a hollow rotor located in said stator and having two ends;
a superconducting winding accommodated in said hollow rotor;
a cryogen-delivering pipe articulated or movable along the axis of said hollow rotor and located at one end of said rotor;
a chamber located inside of said rotor, coaxially with said cryogen-delivering pipe and connnected rigidly to said rotor;
one end of said cryogen-delivering pipe, arranged with a clearance inside of said chamber;
said chamber which is rotatable with said rotor flares out from said end of said pipe and initially causes said cryogen to be swirled therein;
at least two helical channels for delivering swirling cryogen to said superconducting winding, and for communicating said chamber with the space of said rotor which accommodates said superconducting winding; and
a needle secured inside of said chamber along its axis, said needle being of sufficient length such that in the advanced position of said cryogen delivering pipe said needle reaches the end of said pipe and facilitates controlling the cryogen flow rate in conjunction with said axially movable cryogen-delivering pipe.

4,194,138

SPARK GAP DEVICES

Bengt Johansson, and Erland Nilsson, both of Ludvika, Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

Filed Nov. 9, 1978, Ser. No. 959,214
Claims priority, application Sweden, Nov. 11, 1977, 7712756
Int. Cl.[2] H01J 1/92; H02H 9/06
U.S. Cl. 313—3 7 Claims



1. Spark gap device comprising a number of arc-resistant insulating elements stacked in spaced relationship to form spaces between adjacent elements, each said element having a through-hole;
at least two metallic electrodes sandwiched between the respective surfaces of adjacent insulating elements in spaced relation to form a spark-over gap therebetween and each electrode including a recessed portion, and the recessed portions of aligned electrodes on respective opposite sides of an insulating element extending through each of said through-holes in contacting relationship;
a metallic electrode arranged on the outer surface of each outer insulating element and including a recessed portion extending into the through-hole of the associated outer insulating element into contacting relationship with an associated one of the at least two metallic electrodes sandwiched between the respective outer insulating element and the next adjacent insulating element; and
said insulating elements each include at least one elevation projecting snugly into the recessed portion of an electrode of an adjacent element.

4,194,139

REFLEX TETRODE FOR PRODUCING AN EFFICIENT UNIDIRECTIONAL ION BEAM

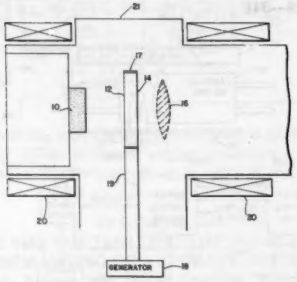
John A. Pasour, Alexandria, Va.; Christos A. Kapetanakos, Bethesda, Md.; Redge A. Mahaffey, Wheaton, Md., and Jeffry Golden, Laurel, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 23, 1978, Ser. No. 936,146
Int. Cl.[2] H01J 23/08, 27/00; H05H 1/00
U.S. Cl. 313—153 15 Claims

1. A reflex tetrode for efficiency producing unidirectionly ion beams comprising:

an evacuated chamber including therein a cathode and an anode structure;

said anode structure spaced from and in axial alignment with said cathode, said anode structure including a first anode spaced from said cathode and made of a material that is a poor source of ions, and a second anode spaced from and in parallelism with said first anode on the side thereof away from said cathode and made of a material that



readily produces a plasma of ions when penetrated by electrons, said second anode being connected electrically with said first anode, and

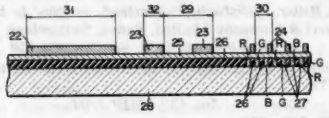
said first and second anodes being made of materials through which electrons easily penetrate so that the application of a pulse of high voltage between the cathode and anodes results in a flow of ions beyond the second anode in the cathode-to-anode direction.

4,194,140

BEAM-INDEXING COLOR IMAGE-PRESENTATION CATHODE RAY TUBE

Eizaburo Hamano, Kumagaya, and Tetsuo Komatsu, Fukaya, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 23, 1978, Ser. No. 889,507
Claims priority, application Japan, Mar. 28, 1977, 52/33342
Int. Cl.[2] H01J *29/32, 31/20*
U.S. Cl. 313—471 **2 Claims**



1. A beam-indexing color image-presentation cathode-ray tube comprising color-phosphor stripes arranged in a regular order and differently responsive to impingement by electron beams to produce light of different colors and index-phosphor stripes arranged in a predetermined geometric relation to the color-phosphor stripes and responsive to impingement by the electron beam to produce index signals, in which said index-phosphor stripes comprise a first index-phosphor stripe, a second index-phosphor stripe and a third index-phosphor stripe, the pitch of the second index-phosphor stripe being three times as large as the pitch of said third index-phosphor stripe, and the width of the first index-phosphor stripe being about twice that of the second index-phosphor stripe.

4,194,141

ELECTROLUMINESCENT UNIT

Teresa Langer, Barbara Krukowska-Fulde, and Jerzy Langer, all of Warsaw, Poland, assignors to Osrodek Badawczo-Rozwojowy Monokrysztalow and Uniwersytet Warszawaki Instytut Fizyki Doswiadczalnej, both of Warsaw, Poland

Continuation of Ser. No. 759,375, Jan. 14, 1977, abandoned, which is a continuation of Ser. No. 621,044, Oct. 9, 1975, abandoned. This application Sep. 28, 1978, Ser. No. 947,335
Claims priority, application Poland, Oct. 10, 1974, 174745
Int. Cl.[2] H01J *1/63;* **C09K** *11/10*
U.S. Cl. 313—503 **3 Claims**

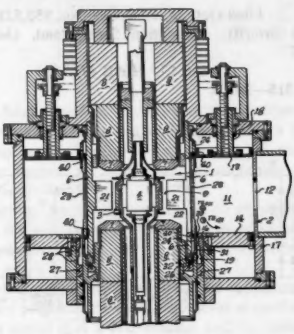
1. An electroluminescent device comprising a metal blocking electrode and an electroluminescent material comprising a semiconducting cadmium fluoride crystal doubly doped with manganese serving as luminescence activators and a trivalent element serving as shallow donors selected from the group consisting of rare earths, scandium, yttrium, gallium and indium, the electron concentration in the doubly doped crystal being greater than 10^{15} cm^{-3}, the concentration of manganese impurities ranging from 0.1 mole percent to 5 mole percent, and wherein the doubly doped cadmium fluoride crystal is separated from the metal blocking electrode by an insulating or semi-insulating layer, electroluminescence occurring under the action of a high electric field at the depletion polarization of a semiconductor.

4,194,142

MODE CONTROL APPARATUS FOR A SEPARABLE-INSERT COAXIAL MAGNETRON

William A. Gerard, Andover, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 10, 1978, Ser. No. 924,280
Int. Cl.[2] H01J *25/50*
U.S. Cl. 315—39.77 **6 Claims**



1. Magnetron apparatus comprising:

a vacuum-sealed interaction cavity assembly including:

an axially-disposed cathode member,

a anode member having an axially-extending medially slotted wall portion radially-spaced from the cathode member,

a dielectric window member spaced radially from and surrounding said anode wall portion, and

a cavity-sealing metallic connector strip member extending between each axial end portion of the dielectric window member and the proximate axial end portion of the anode wall portion,

said dielectric window member sealably covering each anode member slot and having an axial length considerably less than said anode member whereupon the requisite axial extent of at least one of the metallic strip members is

of sufficient electrical length of substantially impede longitudinally flowing electrical current, and

a resonant cavity assembly formed for removably receiving said interaction cavity assembly, said resonant cavity assembly including:

axially-spaced end walls defining the axial extent of the cavity, one of the end walls being adjustable for tuning purposes and the other being relatively fixed whereby the cavity has an adjustable tuning end and a fixed end, said fixed end further having an axially-extending side wall spaced radially from said anode wall portion for providing an axially-extending choke cavity having an entrance opening from said resonant cavity, and

said magnetron apparatus further including:

a lossy-material choke absorber member in said choke cavity for receiving and suppressing resonant cavity current modes coupled into the choke cavity through said entrance,

said one metallic connector strip member extending axially through said choke cavity whereby said cavity-coupled current modes tend to flow longitudinally through it, and

an electrically-conductive flexible gasket member disposed in close proximity to said choke cavity entrance between and in electrical contact with said connector strip and said anode wall portion whereby said modes present in said resonant cavity and applied to said strip member at said choke cavity entrance are shorted through said gasket member, said shorting removing said strip member impedance and permitting the desired mode suppression by said choke cavity and its absorber member.

4,194,143

POWER SUPPLY FOR FLASH LAMP

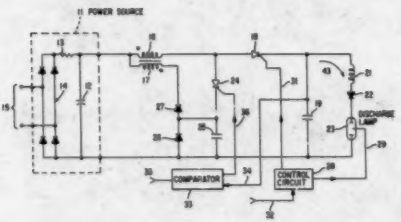
Rudolf Farkas, Geneva, and Michel Moulin, Lausanne, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 23, 1978, Ser. No. 953,521

Claims priority, application Switzerland, Oct. 27, 1977, 13107/77

Int. Cl.[2] H05B *41/34*

U.S. Cl. 315—241 R **3 Claims**



1. A power supply circuit for a discharge lamp, having an electric power source outputting a d.c. voltage and capable of reabsorbing electrical energy, and further having an energy transferring circuit inserted between the electric power source and a first capacitor connected to the lamp, the capacitor being charged via the energy transferring circuit and adapted to store the energy required for each discharge across the lamp, wherein the energy transferring circuit comprises:

a first current path comprising the primary winding of an autotransformer and adapted to transfer current from the electric power source to the first capacitor until the voltage across it reaches a predetermined value,

a second current path comprising a second capacitor for storing part of the surplus energy stored in the autotransformer during the charging of the first capacitor, and

a third current path comprising the secondary winding of the autotransformer, which path serves for returning the unused energy stored in the autotransformer and in the second capacitor to the electric power source.

4,194,144

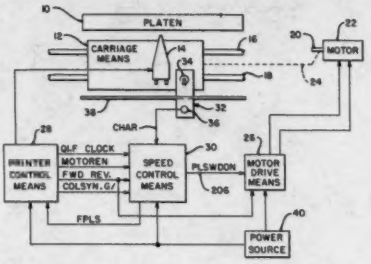
CONSTANT VELOCITY DRIVING MEANS

Jack H. Reynolds, Bellbrook, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Jul. 5, 1977, Ser. No. 813,191

Int. Cl.[2] H02P *5/34, 5/40*

U.S. Cl. 318—341 **26 Claims**



1. A driving means comprising:

means for sensing the actual velocity of a moveable member whose velocity is to be controlled;

motor drive means including a motor for driving said moveable member; and

digital circuit means operatively coupling said sensing means and said motor drive means for controlling the duration of an energizing pulse to said motor drive means to enable said motor to drive said moveable member at a desired constant velocity;

said circuit means including means for inversely varying the duration of said energizing pulse in accordance with said actual velocity; and

said means for inversely varying the duration of said energizing pulse including a digital counter with means for alternately presetting said counter with a first count which corresponds to a desired off period for said motor and with a second count which is inversely related to the actual velocity of said moveable member.

4,194,145

METHOD FOR MONITORING THE RUN-UP TO SPEED OF ASYNCHRONOUS MOTORS AND APPARATUS FOR THE PERFORMANCE THEREOF

Franz Ritter, Fislisbach, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Feb. 10, 1978, Ser. No. 876,630

Claims priority, application Switzerland, Mar. 4, 1977, 2701/77

Int. Cl.[2] H02P *1/04*

U.S. Cl. 318—799 **15 Claims**

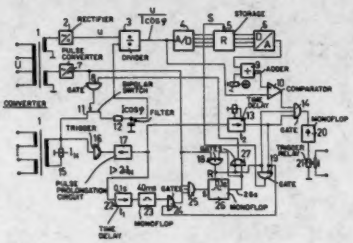
1. A method of monitoring the run-up to speed of asynchronous motors which are turned-off within a permissible blocking time of the motor when the speed run-up is improper, comprising the steps of:

turning-on the monitored motor;

determining a first electrical magnitude dependent upon the phase angle between the motor current and the motor voltage after expiration of a first time-delay following turning-on of the motor;

determining a second value of said electrical magnitude which is dependent upon the phase angle between the motor current and the motor voltage after expiration of a second time-delay following turning-on of the motor;

comparing both the first and second values with one another; and

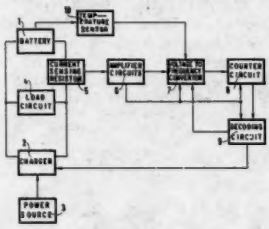


turning-off the motor when the comparison of the first and second values with one another produces a magnitude indicative of improper run-up to speed of the motor.

4,194,146
DEVICE FOR CONTROLLING THE CHARGING AND DISCHARGING OF A STORAGE BATTERY

Eric Patry, Nogent, and Daniel Lelaidier, Neuilly, both of France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Aug. 11, 1977, Ser. No. 823,659
Claims priority, application France, Aug. 11, 1976, 76 24473
Int. Cl.[2] H02J 7/04; G01R 11/66
U.S. Cl. 320—44 **9 Claims**



1. A device for monitoring the charging and discharging current of a storage battery and for controlling a charger connected to the battery, the device comprising:

a current sensing resistor adapted to be connected in series with a battery, the voltage across said resistor being proportional to the current through the battery and being referred to hereinafter as the input voltage;

at least one chopper amplifier stage providing an amplified voltage with an absolute value proportional to said input voltage;

a voltage to frequency converter providing a train of pulses at a frequency proportional to the absolute value of said amplified voltage;

a counter responsive to said pulses and to the polarity of the input voltage, the counter being incremented or decremented by said pulses in accordance with the polarity of said input voltage, the state of a logic output of the counter being representative of the state of charge of the battery; and

a decoding circuit responsive to the logic output state of said counter and adapted to be connected to the charger for limiting the charge rate of said charger to no more than a trickle charge when the counter output state corresponds to full charge of the battery, characterized in that said chopper amplifier state comprises:

an oscillator;

a first analog gate controlled by said oscillator and which converts said input voltage into a periodic voltage with an amplitude equal to the absolute value of the input voltage and whose phase is shifted by π each time the polarity of the input signal changes;

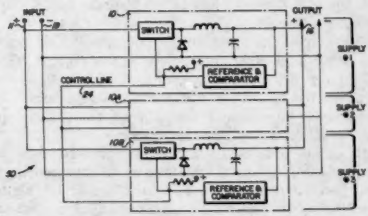
an amplifier and associated filter providing an amplified alternating voltage in phase with said periodic voltage and with an amplitude proportional to that of said periodic voltage; and

a second analog gate controlled by said oscillator converting said amplified alternating voltage into a direct current voltage with an absolute value proportional to the amplitude of said amplified alternating voltage.

4,194,147
PARALLEL CONNECTED SWITCHING REGULATOR SYSTEM

Francis L. Payne, and Ernest E. Godsey, both of Tucson, Ariz., assignors to Burr-Brown Research Corporation, Tucson, Ariz.

Filed Dec. 5, 1977, Ser. No. 857,089
Int. Cl.[2] G05F 1/40
U.S. Cl. 323—17 **21 Claims**



1. A switching regulator having a switching transistor, an inductor, and input, and an output for producing a regulated output voltage at the output in response to an unregulated input voltage applied to the input, said switching regulator comprising in combination:

(a) comparator means responsive to the regulated output voltage for producing a first signal indicative of whether the regulated output voltage exceeds a predetermined voltage level;

(b) first means coupled to a first node and to said comparator means for producing a first logical level at the first node if the first signal is at a first voltage and for presenting an open circuit impedance to the first node if the first signal is at a second voltage;

(c) second means coupled to the first node for producing a second logical level at the first node if an open circuit impedance is presented to the first node;

(d) a control conductor coupled to the first node for conducting the voltage of the first node, whereby the voltage of the first node may be coupled to corresponding first nodes of other switching regulators coupled in parallel with said switching regulator in order to effect uniform loading of said switching regulator and the other switching regulators; and

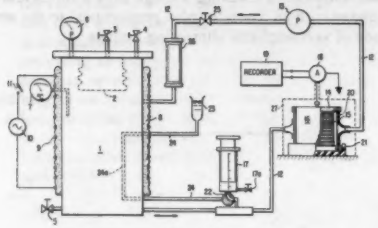
(e) third means coupled to said first means and to the base of said switching transistor for turning said switching transistor on when the first node is at the first logical level and for turning said switching transistor off when the first node is at the second logical level.

4,194,148

MEASURING APPARATUS FOR MEASURING A CHARGING DEGREE OF LIQUID

Hitoshi Ohkubo, Anjo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 25, 1978, Ser. No. 872,119
Int. Cl.[2] G01R *5/28, 29/12;* G01N *27/60*
U.S. Cl. 324—453 **10 Claims**



1. A measuring apparatus for measuring the charging degree of a liquid comprising:

a closed circulating system for circulating a base liquid, the closed circulating system including a tank for containing a base liquid, said tank including inlet means for receiving a supply of said base liquid, a piping having two ends in fluid communication with the tank, and a pump attached in the piping to draw the base liquid from the tank through the piping and back to the tank;

static electricity generating means coupled to said piping and having a member interposed in the middle of the circulating system for causing static electricity to be generated by constant friction with the circulating base liquid;

detecting means for detecting the static electricity generated in the static electricity generating means; and

injecting means coupled to said piping and disposed upstream of the position of the static electricity generating means and downstream of said tank in the circulating system for injecting into the circulating base liquid a small quantity relative to the quantity of circulating base liquid of a liquid whose charging degree is to be measured;

whereby any difference in static electricity caused by charging of the injected liquid whose charging degree is to be measured is detected by the detecting means to provide an indication of the charging degree of the injected liquid.

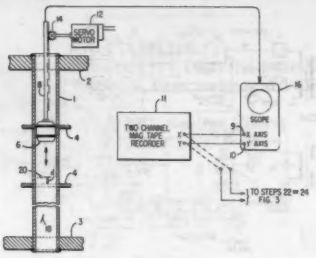
4,194,149

METHOD FOR GENERATING THE EDDY CURRENT SIGNATURE OF A FLAW IN A TUBE PROXIMATE A CONTIGUOUS MEMBER WHICH OBSCURES THE FLAW SIGNAL

Amos E. Holt; Allen E. Wehrmeister, and Hubert L. Whaley, all of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 15, 1977, Ser. No. 860,811
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—220 **9 Claims**

1. The method of generating the eddy current signature of a flaw in a tube proximate a contiguous member which obscures the flaw signature comprising, traversing a reference tube with an eddy current sensor proximate a similar contiguous member to obtain a reference eddy current signature of the first named contiguous member, performing a duplicate traverse of the first named tube to obtain a composite eddy current signature of the flaw and contiguous member, and generating the eddy current signature of the flaw by comparing the composite signature with the reference signature "wherein the step of comparing the composite signature with the reference signature to generate the flaw signature comprises, determining the vector of the reference signature at selected travel points of the sensor, determining the vector of the composite signature at the selected travel points and constructing the flaw signature from the resultant vectors derived by the vector subtraction of



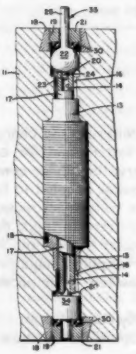
the reference vector from the composite vector at the selected travel points".

4,194,150

METHOD AND APPARATUS FOR REDUCING MAGNETOMETER ERRORS

Arthur W. Obenschain, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 26, 1958, Ser. No. 763,758
Int. Cl.[2] G01R *33/02*
U.S. Cl. 324—245 **1 Claim**

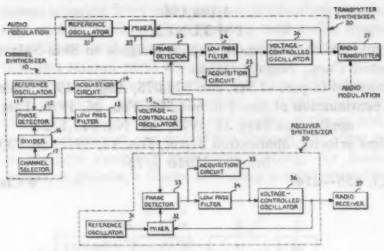


1. A method of correcting errors in the electrical characteristics of a total field magnetometer after the magnetometer is tested and said errors are measured and resolved, which comprises correcting the core turnover errors in said total field magnetometer by replacing a pair of cores thereof with a new pair of cores having the same total reductance as the first pair and the difference in reductance of the replaced cores different than the difference in reductance of the cores which are replaced, and subsequently correcting the block misparabolism errors in said magnetometer by adjusting at least one of the cores of the magnetometer to a new angular setting thereof so that the indication of field strength will be within prescribed limits of accuracy.

4,194,151
MULTIFREQUENCY GENERATOR

Jens O. Gregersen, Karlslunde, and Sigurd B. Sorensen, Taastrup, both of Denmark, assignors to General Electric Company, Lynchburg, Va.

Filed Jun. 29, 1978, Ser. No. 920,372
Int. Cl.² H03B *3/08*
U.S. Cl. 455—76 **15 Claims**



1. An improved system for generating a plurality of selectable transmitter and receiver frequencies comprising:

a. a first phase-locked loop having a first reference oscillator, a phase detector having an input connected to said first reference oscillator, and a first controlled oscillator and frequency divider circuit connected between the output of said phase detector and an input of said phase detector for generating a relatively small bandwidth first signal whose frequency is determined by said reference oscillator and said frequency divider;

b. a second phase-locked loop having a second reference oscillator, a mixer having an input connected to said second reference oscillator, a phase detector having an input connected to said mixer and having an input connected to said first controlled oscillator, and a second controlled oscillator connected between the output of said phase detector and an input of said mixer for generating a second signal whose frequency is determined by the frequency of said first signal and the frequency of said second reference oscillator;

c. and a third phase-locked loop having a third reference oscillator, a mixer having an input connected to said third reference oscillator, a phase detector having an input connected to said mixer and having an input connected to said first controlled oscillator, and a third controlled oscillator connected between the output of said phase detector and an input of said mixer for generating a third signal whose frequency is determined by said frequency of said first signal and the frequency of said third reference oscillator.

4,194,152
RADIO COMMUNICATION SYSTEM

Takeshi Tokoro, 3-11, Tenjin-cho, Fuchu-shi, Tokyo, Japan

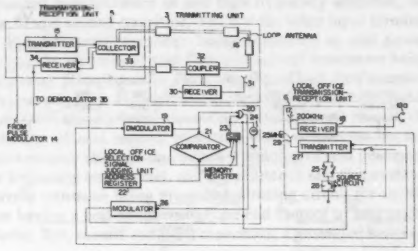
Filed Apr. 24, 1978, Ser. No. 899,520
Claims priority, application Japan, Apr. 27, 1977, 52/48797; Apr. 27, 1977, 52/48798
Int. Cl.² H04Q *7/02*
U.S. Cl. 455—31 **10 Claims**

1. A radio communication system providing two-way voice communication between a central office and a local office, comprising:

a plurality of local offices; and

a central office including means for producing a voice signal to be transmitted to the local offices, a local office selection signal generator which generates, in a time sharing basis, local office selection signals respectively assigned to the plurality of local offices, and transmitting means for radiating said local office selection signals toward said local offices together with said voice signal;

each local office including means for receiving the radiated local office selection signals and said voice signal, local office selection signal judging means which judges whether a received local office selection signal is assigned thereto or not, and means for transmitting a response voice signal and a response signal to said central office when said judging means judges that the received local office selection signal is assigned to said local office;

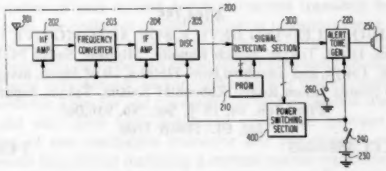


said central office further including means for receiving signals from said local offices, response signal judging means for judging that a response signal received by the central office was sent from which one of the local offices, and display means responsive to the output of said response signal judging means for displaying the identification of a local office that has sent said response signal.

4,194,153
DIGITAL RADIO PAGING COMMUNICATION SYSTEM

Masaru Masaki, and Akio Yotsutani, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1978, Ser. No. 942,260
Claims priority, application Japan, Sep. 16, 1977, 52/112052
Int. Cl.² H04B *5/04*
U.S. Cl. 455—31 **12 Claims**



1. A digital radio paging communication receiver for receiving a carrier wave modulated with a preamble digital signal, a calling digital signal and an end mark digital signal, comprising: first means for receiving said modulated carrier wave and demodulating it into said preamble digital signal, calling digital signal and end mark digital signal; second means for recovering a clock pulse from the output of said first means; third, fourth and fifth means connected to the output of said first means for detector said preamble digital signal, said calling digital signal and said end mark digital signal in synchronism with said clock pulse, respectively; sixth means for supplying a power source voltage to said first means; seventh means for generating first pulses having a predetermined period; and eighth means provided between said first means and said sixth means for controlling the supply of said power source voltage in response to the output of said seventh means or in response to the outputs of said third means and said fifth means.

4,194,154

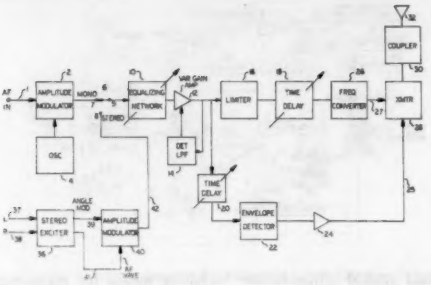
NARROW BANDWIDTH NETWORK COMPENSATION METHOD AND APPARATUS

Leonard R. Kahn, 70 N. Grove St., Freeport, N.Y. 11520

Continuation-in-part of Ser. No. 662,832, Mar. 1, 1976, abandoned. This application Apr. 26, 1978, Ser. No. 900,095

Int. Cl.[2] H04B *1/04*

U.S. Cl. 455—114 **15 Claims**



1. A method for reducing distortion of modulated waves caused by passive devices operating at power levels substantially greater than the power level at which the modulated wave was generated, such as transducers and antenna systems used for transmitting modulated waves which alter the desired amplitude and phase relationships between the upper and lower sidebands of the modulated wave creating said distortion comprising;

(a) generating a modulated wave at a power level substantially below the power level fed to the passive device,

(b) altering the phase and amplitude relationships between the upper and lower sidebands of the wave generated in Step (a) in such a manner as to compensate for the distortion caused by the passive device,

(c) amplifying the altered modulated wave of Step (b) to a level required to drive the passive device in an amplifier which faithfully maintains the altered relationships between the upper and lower sidebands of the modulated wave, and

(d) feeding the amplified wave to the passive device.

4,194,155

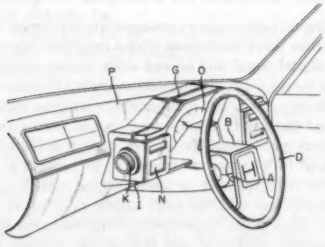
RADIO RECEIVING DEVICE FOR AUTOMOTIVE USE

Kazuo Hirai, Tokyo; Junich Kamata, Miyoshi; Sadao Makiguchi, Tokyo, and Kazuhiro Iwai, Hidaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1978, Ser. No. 916,047

Int. Cl.[2] H04B *1/06*

U.S. Cl. 455—345 **7 Claims**



1. A radio receiving apparatus for automotive use comprising: an instrument panel in front of the driver's seat having a protruding portion formed in the vicinity of the steering wheel, station-number and frequency indicating means arranged in said protruding portion of said instrument panel for displaying a specified frequency corresponding to each of a plurality of presetted station numbers, control means arranged on one side of the protruding portion for selecting a desired station number and indicator means arranged in the front face of the protruding portion for indicating a station number and corresponding frequency as selected by said control means.

4,194,156

FM TUNER

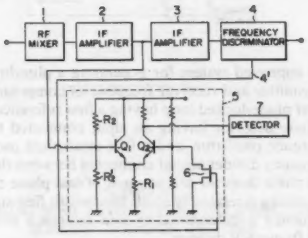
Nobuyuki Sakabe, Okazaki, Japan, assignor to Shin-Shirasuna Electric Corp., Nagoya, Japan

Continuation-in-part of Ser. No. 821,075, Aug. 2, 1977, which is a continuation of Ser. No. 661,504, Feb. 26, 1976. This application May 31, 1978, Ser. No. 911,172

Claims priority, application Japan, Jun. 17, 1975, 50/73337

Int. Cl.[2] H04B *1/16*

U.S. Cl. 455—214 **6 Claims**



1. An FM tuner including means for producing an intermediate frequency signal; frequency discriminator means with "S" characteristics for frequency-discriminating said intermediate frequency signal; differential amplifier means responsive to a substantially rectilinear portion of said "S" characteristics to produce an output signal whose amplitude becomes maximum at a frequency position corresponding to the center frequency position of said intermediate frequency signal, said differential amplifier means comprising a first transistor and a second transistor connected to each other so as to constitute a differential amplifier, and a variable resistance element connected to said frequency discriminator means in such a manner that the internal resistance is variable depending on a d.c. component output which is provided by said frequency discriminator means, said variable resistance element being associated with said differential amplifier, wherein said intermediate frequency signal is imparted to the base of said first transistor; said variable resistance element being utilized as a base bias resistor for said second transistor, and said output signal being derived from the collector of said second transistor; and detector means responsive to said out-put signal provided by said differential amplifier means to produce an indication as to whether said tuner is in a tuned state or not.

4,194,157

PORTABLE RADIO RECEIVER WITH DETACHABLE SPEAKER UNIT

Takeshi Uno, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 15, 1977, Ser. No. 833,708

Claims priority, application Japan, Sep. 14, 1976, 51-124750[U]

Int. Cl.[2] H04B *1/08*

U.S. Cl. 455—348 **13 Claims**

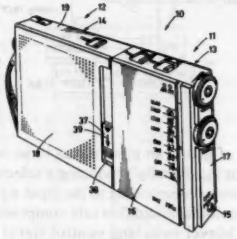
1. A portable radio receiver comprising: a first part having a radio tuner and an earphone jack and being operative for receiving a radio frequency signal and providing an electrical audio frequency signal at said jack;

a second part having a speaker unit;

said first and second parts having respective first and second cabinets with mating surfaces, respectively, at which said cabinets can be brought together in abutting relationship;

assembling means for detachably assembling together said first and second parts with said mating surfaces of the respective cabinets in said abutting relationship, said assembling means including complementary mechanical coupling members at said mating surfaces of the first and second cabinets, respectively, and electrical coupling means separate from said mechanical coupling members at said mating surfaces; for applying said audio frequency signal from said first part to said speaker unit when said first and second parts are used together;

one of said mechanical coupling members defining at least one undercut groove extending a substantial distance along the respective one of said mating surfaces and having an opening at one end of the groove, the other of said mechanical coupling members defining, for each said undercut groove, a flange extending a substantial distance



along the other mating surface and having a cross-sectional shape corresponding to that of the respective undercut groove so as to be slidably insertable in the latter through said end opening upon relative displacements of said first and second cabinets in directions parallel with each said groove and flange;

said electrical coupling means including cooperative terminal means at said mating surfaces, respectively, and being engaged with each other for establishing electrical connections between said first and second parts when the latter are assembled together with said mating surfaces in said abutting relationship; and

detachable protective case means adapted to at least partly envelop said first part when the latter is detached from said second part said case means including a mechanical coupling member which is complementary to, and engageable with said mechanical coupling member at the mating surface of said cabinet of the first part, and by which said case means can be detachably assembled with said first part.

4,194,158

INTEGRATED FRONT END CIRCUIT FOR VHF RECEIVER

Kenzo Tanabe, and Masashi Kanno, both of Katano, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

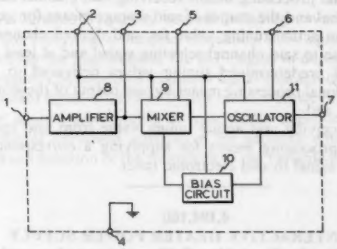
Filed Nov. 9, 1977, Ser. No. 849,959

Claims priority, application Japan, Nov. 15, 1976, 51-137678; Nov. 15, 1976, 51-153602[U]

Int. Cl.[2] H04B *1/28*

U.S. Cl. 455—333 **5 Claims**

1. A front end circuit for a VHF receiver comprising: an input terminal for a VHF signal; a power source; a resonance tuning circuit having a coil connected at one end thereof to said power source; a high frequency amplifier having a grounded base transistor, the emitter of said grounded base transistor being connected to said input terminal, the base of said grounded base transistor being connected to said power source and the collector of said grounded base transistor being connected to said power source through said coil of said resonance tuning circuit; an intermediate frequency transformer having a primary winding connected at one end thereof to said power source and a secondary winding; a mixer consisting of a differential amplifier composed of first and second transistors, a first constant current transistor and a first resistor, the base of said first transistor, which is one input terminal of said differential amplifier, being connected to the collector of said grounded base transistor of said high frequency amplifier, the base of said second transistor, which is the other input terminal of said differential amplifier, being connected to said power source, the emitters of said first and second transistors being connected in common to the collector of said first constant current transistor through said first resistor, the collector of said first transistor being connected to said power source, the collector of said second transistor being connected to said power source through said primary winding of said intermediate frequency transformer, and the emitter of said first constant current transistor being grounded; a tuning circuit for oscillation having a coil connected at one end thereof to said power source; first, second and third capacitors; a grounded base type



transistor oscillating circuit consisting of an oscillation transistor, a second constant current transistor, the base of said oscillation transistor being connected to said power source, the collector of said oscillation transistor being connected to said power source through said coil of said tuning circuit for oscillation, and the emitter of said oscillation transistor being connected to the collector of said second constant current transistor so that bias current to said oscillation transistor is provided from and controlled by said second constant current transistor, the emitter of said second constant current transistor being grounded, the collector of said oscillation transistor being also connected to the base of said first constant current transistor of said mixer through said first capacitor for providing an oscillation signal to said mixer, said second capacitor being connected between the collector and the emitter of said oscillation transistor and said third capacitor being connected between the emitter of said oscillation transistor and the ground; and a transistor bias circuit including a current mirror transistor and a second resistor, said bias circuit driving said first constant current transistor of said mixer and said second constant current transistor of said oscillating circuit according to operation of a current mirror circuit.

4,194,159

ELECTRONIC TUNING SYSTEM

Tadao Sasaki, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 18, 1978, Ser. No. 897,394

Claims priority, application Japan, Apr. 21, 1977, 52/46108

Int. Cl.[2] H04B *1/26*

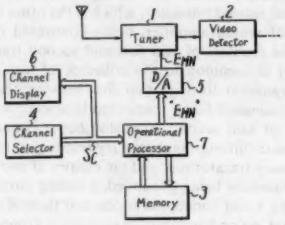
U.S. Cl. 455—179 **7 Claims**

1. An electronic tuning apparatus comprising:

an electronic tuner capable of tuning in a plurality of channels within a predetermined frequency range in response to a variable tuning signal;

means for selectively generating a channel selecting signal corresponding to a desired channel from among said plurality of channels;

storage means for storing a number of predetermined tuning values each corresponding to a predetermined frequency, said number being less than the total number of said plurality of channels, said storage means having an output to which said predetermined tuning values are selectively delivered;



operational processing means receiving said channel selecting signal and the output of said storage means for generating an actual tuning value for said desired channel in response to said channel selecting signal and at least two of said predetermined tuning values delivered to said operational processing means by said output of the storage means; and

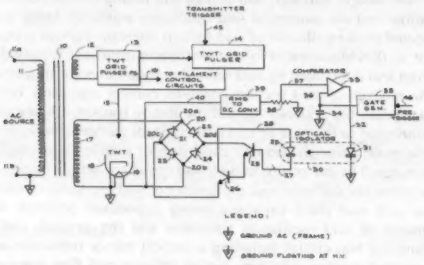
means receiving said actual tuning value from said operational processing means for supplying a corresponding tuning signal to said electronic tuner.

4,194,160

NONINTERACTIVE HEATER POWER SUPPLY

Richard S. Loucks, Northridge, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 2, 1977, Ser. No. 830,067
Int. Cl.² H03K 3/42; H05B 9/06
U.S. Cl. 328—267 **11 Claims**



1. An AC power supply regulation system with means for eliminating AC magnetic field interactive effects during a predetermined relatively small time period, comprising:

an alternating current source connected to energize a heatable element the temperature of which is to be stabilized;

first means for sensing the RMS AC voltage applied to said element and for converting said RMS voltage to an analog signal as a function of the true RMS value of said AC voltage;

second means connected in the current path between said source and said element, said second means comprising a circuit responsive to chopping control signals for cyclically interrupting the current through said element;

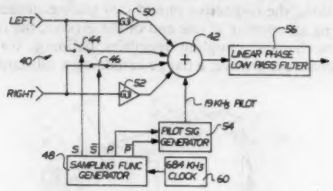
and third means responsive to said analog signal and to external synchronizing signals for generating said chopping control signals as variable time duration gates of repetition frequency high compared to the frequency of said AC voltage, said chopping control signals being applied to said second means in a sense tending to stabilize the true RMS value of the resulting chopped AC current flowing through said element.

4,194,161

SWITCHING MODULATORS AND DEMODULATORS UTILIZING MODIFIED SWITCHING SIGNAL

David L. Hershberger, Quincy, Ill., assignor to Harris Corporation, Melbourne, Fla.

Filed Oct. 25, 1978, Ser. No. 954,365
Int. Cl.² H03C 1/06; H03D 1/04; H04H 5/00
U.S. Cl. 329—50 **8 Claims**



7. A method of gating an input signal to an output line at a first rate without incidentally producing a selected component on said output line corresponding to the input signal modulated at a given odd multiple of said first rate comprising the steps of:

generating a bilevel switching control signal having a harmonic component whose frequency corresponds to said first rate, but not including a harmonic component whose frequency corresponds to said given odd multiple of said first rate, and

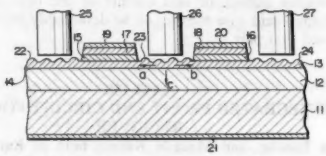
gating said input signal to said output line in accordance with said bilevel switching control signal.

4,194,162

SEMICONDUCTOR DEVICE

Yutaka Uematsu, Yokosuka, and Yoichi Unno, Kamakura, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 22, 1978, Ser. No. 889,115
Claims priority, application Japan, Apr. 6, 1977, 52-38574
Int. Cl.² H01S 3/19
U.S. Cl. 330—4.3 **3 Claims**



1. A semiconductor device comprising a semiconductor body, a semiconductor layer as a photoconductive path disposed on one side of said body and defining a pn-junction between said layer and body, first and second diffraction gratings formed at a distance from each other on top of said semiconductor layer, a first electrode disposed between said first and second diffraction gratings on top of said semiconductor layer, a second electrode disposed on the other side of said semiconductor body so as to face said first electrode, a third diffraction grating formed at a distance from said first diffraction grating on top of said semiconductor layer and a third

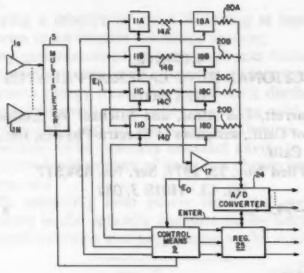
electrode disposed between said first and third diffraction gratings on top of said semiconductor layer.

4,194,163

FLOATING POINT AMPLIFIER MEANS AND METHOD

Ronald G. Gillespie, Old Tappan, N.J., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Aug. 3, 1978, Ser. No. 930,634
Int. Cl.² H03G *3/20*
U.S. Cl. 330—86 **6 Claims**



1. A wide dynamic range automatic gain ranging amplifier system comprising means for receiving an analog input signal, a single stage amplifier having an input connected to the receiving means for amplifying a received analog signal to provide an output signal, control means connected to the receiving means and to the amplifier for controlling the gain of the amplifier in accordance with the output signal and providing digital gain signals corresponding thereto, and analog-to-digital converter means connected to the amplifier for providing digital signals corresponding to the output signal, in which the digital signals provided by the control means and the converter means comprise a floating point word including a mantissa and an exponent in the form:

$$Q = \pm x\, b^{-k};$$

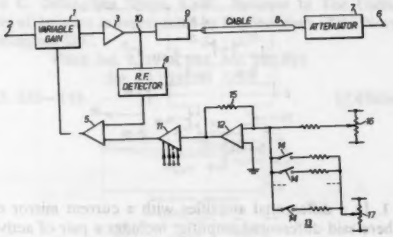
where Q represents the magnitude of the input signal to said system; wherein b represents a predetermined gain standard wherein x, the mantissa is represented by the digital signals from the converter means and corresponds to the amplitude of the output signal; and wherein k, the exponent, is represented by the digital signals from the control means and corresponds to the number of gain stages and ranges from 1 through n in unit steps; and the receiving means includes a plurality of n input resistor networks having a first common connection adapted to receive the analog input and a second common connection to the input of the amplifier; and the control means includes a plurality of n feedback resistor networks connected between the input and the output of the amplifier, and control means connected to the output of the amplifier and to the pluralities of input and feedback resistor networks for providing a plurality of control signals in accordance with the output signal so as to control the gain of the amplifier; each control signal is provided to corresponding input and feedback resistor networks.

4,194,164

VARIABLE FREQUENCY SOURCES

David P. Owen, Dunstable, England, assignor to Marconi Instruments Limited, Chelmsford, England

Filed Nov. 7, 1978, Ser. No. 958,431
Claims priority, application United Kingdom, Nov. 24, 1977, 49035/77
Int. Cl.² H03G *3/20*
U.S. Cl. 330—130 **6 Claims**



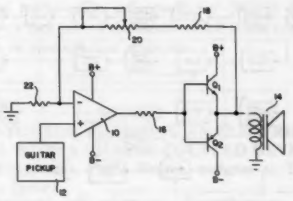
1. A variable frequency source including a variable gain stage for receiving a variable frequency R.F. signal and for controlling the amplitude of the R.F. signal in dependence on its frequency by means of a control signal characterised in that the control signal is derived from a resistor network, the value of the control signal being at least partly dependent on the selection of particular resistors in the network which are selected as a function of the frequency of the variable R.F. signal.

4,194,165

MINIATURE GUITAR AMPLIFIER

Peter J. Skulski, P.O. Box 5583, Mission Hills, Calif. 91345

Filed Jun. 28, 1978, Ser. No. 919,909
Int. Cl.² H03F *3/183*
U.S. Cl. 252—255 **3 Claims**



1. A miniature guitar amplifier, for receiving a signal from a guitar pickup and at least one small speaker comprising

a pair of complementary power transistors connected directly in a common-emitter push-pull configuration to said speaker,

an operational amplifier having a differential input stage to provide a noninverting input terminal for receiving said guitar pickup signal, an inverting input terminal, and an output terminal,

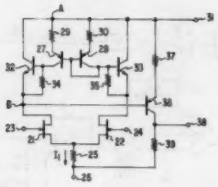
means for directly connecting the output of said operational amplifier to said power transistors to drive said speakers, and

variable resistance means for directly connecting the emitter output of said power transistors to said inverting input terminal of said operational amplifier.

4,194,166
DIFFERENTIAL AMPLIFIER WITH A CURRENT MIRROR CIRCUIT

Kazumasa Sakai, and Hiroshi Watanuki, both of Tokyo, Japan, assignors to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1978, Ser. No. 874,203
Claims priority, application Japan, Feb. 4, 1977, 52-10730
Int. Cl.[2] H03F 3/45
U.S. Cl. 330—257 **9 Claims**

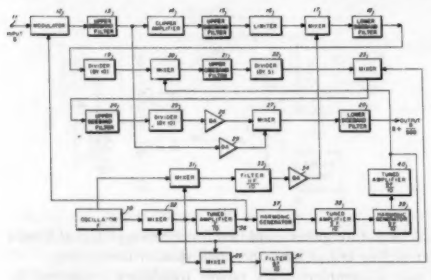


1. In a differential amplifier with a current mirror circuit where said differential amplifier includes a pair of active elements having (a) control electrodes respectively connected to the input terminals of the differential amplifier, (b) first electrodes connected together, and (c) second electrodes, the improvement where the collectors of a pair of transistors comprising the current mirror circuit are respectively connected to the bases of a pair of transistors of polarity reverse that of the current mirror transistors, the collectors of the reversed polarity transistors are connected to a power supply, the emitters of the reversed polarity transistors are respectively connected to said second electrodes of the active elements of the differential amplifier, and resistors are respectively connected between the bases and emitters of the reversed polarity transistors.

4,194,167
UP-DOPPLER SIMULATOR

Milton D. Papineau, Kailua, Hi., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 10, 1963, Ser. No. 250,991
Int. Cl.[2] H03F 3/14
U.S. Cl. 331—38 **19 Claims**



1. Means for up-Dopplerizing an input signal comprising in combination,

means for generating a predetermined F frequency signal,

means effectively connected to said predetermined F frequency signal generating means for producing an F/10 frequency signal, an 8F/10 frequency signal, a 9F/10 frequency signal, and an 11F/10 frequency signal,

means connected to said F/10 frequency signal producing means for heterodyning an input S frequency signal with said F/10 frequency signal for producing an F/10+S frequency signal,

means effectively coupled to said last mentioned heterodyning means and said 11F/10 frequency signal producing means for producing an F−S frequency signal,

means effectively coupled to said F−S frequency signal producing means and said 9F/10 frequency signal generating means for producing an F−S/10 frequency signal,

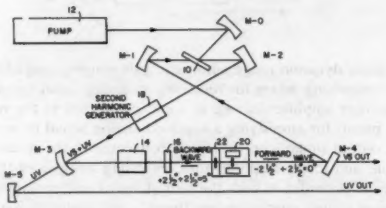
means effectively coupled to said F−S/10 frequency signal producing means and said 8F/10 frequency signal generating means for producing an F/10−S/500 frequency signal,

and means effectively connected to said F/10−S/500 frequency signal producing means and the aforementioned F/10+S frequency signal producing means for producing an S+S/500 frequency signal.

4,194,168
UNIDIRECTIONAL RING LASER APPARATUS AND METHOD

Steven M. Jarrett, Los Altos, and Michael W. Leitner, Palo Alto, both of Calif., assignors to Spectra-Physics, Inc., Mountain View, Calif.

Filed Nov. 25, 1977, Ser. No. 854,517
Int. Cl.[2] H01S 3/083
U.S. Cl. 331—94.5 C **8 Claims**

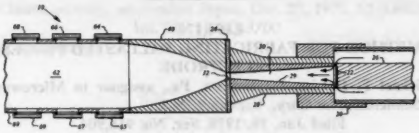


1. A ring laser comprising a laser resonator capable of supporting running waves in both forward and backward directions within said resonator, an ion laser pumped liquid dye capable of lasing over a wide wave length range disposed within the path of radiation within said resonator structure and coupled thereto, tuning means for continuously tuning the ring laser over a tuning range of lasing to produce any single selected frequency or wave length within said range, ion laser pumping means for pumping said dye to develop running first and second laser beam waves propagating both in the forward and backward direction respectively within said resonator, polarization shifter means for causing preferential oscillation of one of said waves in unidirectional single frequency operation and effective to produce high single frequency power over the tuning range, said shifter means comprising a combination of a Faraday rotator in series with a polarization rotator and in which combination each rotator is rotated through only a small angle to shift the plane of polarization of a propagating wave traveling in one direction in an amount which is sufficient to impair amplification and to defeat reinforcement and build-up of laser oscillation of the wave traveling in said one direction while leaving the plane of polarization of the propagating wave traveling in the other direction substantially unaffected so that the unaffected wave is constructively reinforced in gain by said resonator and dye to thereby develop said unidirectional single frequency operation.

4,194,169
MOLECULAR LASER OPERATING ON FUNDAMENTAL AND OVERTONE BANDS

Joseph W. Rich, East Aurora, and Richard C. Bergman, Corfu, both of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Filed Nov. 25, 1977, Ser. No. 854,863
Int. Cl.[2] H01S *3/00*
U.S. Cl. 331—94.5 G **15 Claims**



1. A method for operating a laser on the vibrational fundamental and overtone infrared molecular bands including the steps of:

supplying a mixture of gases including at least one lasant species to an electric discharge section;

flowing said mixture of gases through said discharge section;

vibrationally exciting said at least one lasant species through electron energy transfer in said electric discharge section;

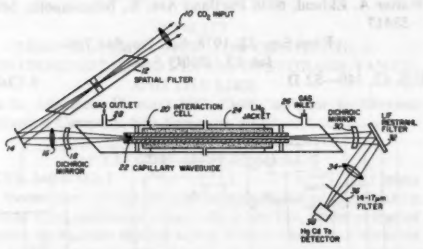
flowing said mixture of gases including said at least one vibrationally excited lasant species through a supersonic expansion to an optically resonant cavity to gas dynamically cool said mixture of gases to a chosen kinetic temperature; and

serially extracting laser power from said cooled flowing mixture in the optically resonant cavity starting with the second overtone and progressing to the fundamental.

4,194,170
SHIFTING OF INFRARED RADIATION USING ROTATIONAL RAMAN RESONANCES IN DIATOMIC MOLECULAR GASES

Norman A. Kurnit, Santa Fe, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 802,400, Jun. 1, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 960,409
Int. Cl.[2] H01S *3/22*
U.S. Cl. 331—94.5 N **40 Claims**



1. A Raman laser for frequency shifting infrared radiation comprising:

an infrared radiation source for producing said infrared radiation;

an interaction cell containing a diatomic molecular gas;

a restrahl reflective capillary waveguide disposed within said interaction cell;

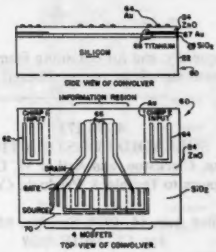
dichroic means disposed at each end of said interaction cell for primarily reflecting frequency shifted radiation and primarily transmitting said infrared radiation from said infrared radiation source;

whereby said capillary waveguide increased focal interaction length between said infrared radiation from said infrared radiation source and said diatomic molecular gas to overcome losses and produce stimulated Raman scattered frequency shifted radiation from rotational transitions in said diatomic molecular gas.

4,194,171
ZINC OXIDE ON SILICON DEVICE FOR PARALLEL IN, SERIAL OUT, DISCRETE FOURIER TRANSFORM

Edward C. Jelks, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 7, 1978, Ser. No. 922,610
Int. Cl.[2] H03H *7/30*
U.S. Cl. 333—149 **17 Claims**



1. A device suitable for the propagation of acoustic waves on its surface comprising:

a substrate of semiconductor material, of which there exists an oxide, excluding the class of piezoelectric materials, the substrate having at least one flat, rectangular, surface, the longer side defining two ends;

a layer of oxide of the semiconductor material, disposed on the flat surface;

a layer of metal disposed on at least a part of the layer of oxide, at both ends thereof;

a layer of a piezoelectric material disposed on the layer of metal and on that part of the oxide over and between the metal; and

at least one metal-oxide semiconductor (MOS) structure disposed on that part of the oxide which is not covered by the layer of piezoelectric material.

4,194,172
APPARATUS FOR FILTERING AN ELECTRICAL SIGNAL WITH A CHARGE-COUPLED DEVICE

Jean-Edgar Picquendar, Paris, France, assignor to Thomson-CSF, Paris, France

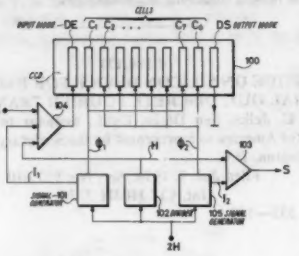
Filed Mar. 16, 1978, Ser. No. 887,340
Claims priority, application France, Mar. 29, 1977, 77 09294
Int. Cl.[2] H03H *7/10, 7/28;* H03K *5/156;* G11C *19/28*
U.S. Cl. 333—165 **4 Claims**

1. An apparatus for filtering an input signal, comprising:

a charged-coupled device having an input diode for receiving said input signal, a grounded output diode, a first plurality of cells weighted so as to represent a recurring filter law, and a second plurality of cells weighted so as to represent a nonrecurring filter law; the cells of said first plurality being interposed one-by-one between the cells of said second plurality;

a first generator for applying to the cells of said first plurality a first set of displacement signals having a predetermined clock rate, and for obtaining from said first set of displacement signals a recurring feedback signal for coupling to said input diode; and

a second generator for applying to the cells of said second plurality a second set of displacement signals having said

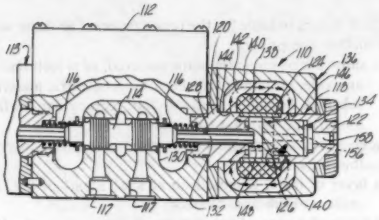


clock frequency, and for obtaining from said second set of displacement signals an output filtered signal.

4,194,173
SOLENOID CONSTRUCTION

Ronald L. Loup, Clarkston, and Arthur W. Gill, Saline, both of Mich., assignors to Double A Products Company, Manchester, Mich.

Filed Aug. 14, 1978, Ser. No. 933,177
Int. Cl.[2] H01F 7/08
U.S. Cl. 335—260 **4 Claims**

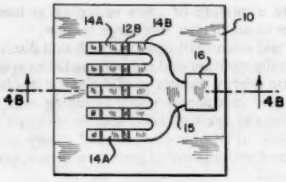


1. A wet plunger solenoid for actuating a hydraulic valve comprising an armature assembly including front and rear magnetic stop pieces, a non-magnetic tube connected at opposite ends respectively to said front and rear magnetic stop pieces and defining therebetween a chamber, said front stop piece having a duct extending axially therethrough in communication with said chamber and for communication with hydraulic fluid within said valve, a pin positioned in said duct for axial movement and extending exteriorly of said front stop piece, and a plunger mounted within said chamber for reciprocal axial movement between said stop pieces and responsive to a magnetic field to exert a biasing action on said pin, and a casing surrounding the circumference of the armature assembly and including a coil and an associated yoke arranged to induce a magnetic flield through said plunger when current is passed through the coil, said yoke having its opposite ends in engagement respectively with the front and rear stop pieces so that the working gap between the plunger and the stop pieces is the only air gap in the induced magnetic field, said tube having an axial length sufficiently small so that said front and rear stop pieces are connected thereto between the locations where engagement of the front and rear stop pieces with said yoke occurs thereby to eliminate an air gap between the yoke and either stop piece, said rear stop piece being cup-shaped with the open end thereof facing said front stop piece and defining a lip, said lip having a step around the outer circumference thereof into which the end of said tube is fitted so that a seating portion extends radially inwardly to the radially inner wall of the cup-shaped stop piece, said plunger being slidably movable in an axial direction in said rear stop piece in engagement with said radially inner wall and having an enlarged head portion for seating on the seating portion defined by the lip when the plunger is moved to its engaged position with the stop piece, the outer wall of said cup-shaped stop piece being in engagement with one end of said yoke, and said enlarged head portion being sufficiently large to expand the flux path area to be at least as great as the flux path area of the front pole piece.

4,194,174
METHOD FOR FABRICATING BALLASTED FINGER ELECTRODE

Michael F. DeLise, Doylestown, Pa., assignor to Microwave Semiconductor Corp., Somerset, N.J.

Filed Jun. 19, 1978, Ser. No. 916,904
Int. Cl.[2] H01C 1/012
U.S. Cl. 338—308 **6 Claims**



1. A method of fabricating a ballasted finger electrode on a substrate comprising the steps of:

forming on such substrate at least one resistive segment at a position for underlying at least one finger electrode;

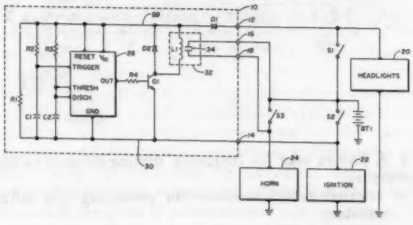
forming at least one dielectric region on said resistive segment; and

forming a plurality of conductive segments defining a finger electrode, said segments being spaced apart in a region overlying at least one of said dielectric regions and electrically connected through said resistive segment underlying said dielectric region.

4,194,175
AUTOMOBILE HEADLIGHT ALARM SYSTEM

Walter A. Eklund, 6036 Portland Ave. S., Minneapolis, Minn. 55417

Filed Sep. 22, 1978, Ser. No. 944,716
Int. Cl.[2] B60Q 5/00
U.S. Cl. 340—52 D **6 Claims**



1. A warning apparatus for use in a vehicle having an ignition switch, headlights, a headlight switch for controlling the headlights, a horn, and a horn switch for operating the horn, the system comprising:

timer means operatively connected to the ignition switch, the headlight switch, and the horn for energizing the horn for a time period of predetermined duration after the ignition switch is turned off while the headlight switch

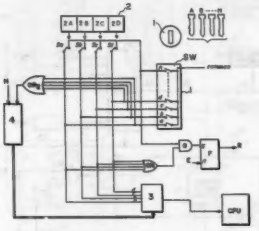
remains on, and wherein turning off the headlight switch during the time period de-energizes the horn.

4,194,176

CASHIER IDENTIFYING ADMINISTRATION IN AN ELECTRONIC CASH REGISTER

Yositaka Fukuma, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 27, 1978, Ser. No. 955,337
Claims priority, application Japan, Oct. 27, 1977, 52/130531
Int. Cl.[2] H04Q *3/00*
U.S. Cl. 340—147 R **4 Claims**



1. A cashier identifying system for an electronic cash register comprising:

a key switch means to which plural kinds of operator clerk keys and a master clerk key are inserted;

key signal developing means for developing signals representation of the keys inserted into said key switch means;

keyboard switch means for introducing an information signal for specifying a specific operator clerk;

means for enabling said keyboard switch means when the master clerk key is inserted into said key switch means; and

a code signal generator for developing a code signal specifying the operator clerk through the use of said signals derived from said key signal developing means when any one of said operator clerk keys is inserted into said key switch means, and through the use of said information signal derived from said keyboard switch means when said master clerk key is inserted into said key switch means.

4,194,177

TRANSDUCER SYSTEM FOR CONTINUOUS MONITORING LIQUID LEVELS IN STORAGE TANKS AND THE LIKE

John S. Adamson, Pleasant Hill, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 25, 1977, Ser. No. 854,917
Int. Cl.[2] G08C *19/16*; H04Q *9/14*
U.S. Cl. 340—152 T **13 Claims**

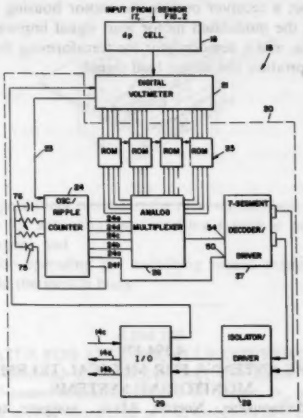
1. Transducer system for generating a digital code indicative of liquid level within a storage tank or the like, upon receipt of a square wave interrogation signal from a transmitter/receiver of a tank gauging system located at a central station remote from said storage tank but electrically connected to said transducer system through an INTERROGATION, a MARK and a SPACE line of said tank gauging system, comprising:

(A) means for providing a series of input signals representative of liquid level within said tank, said means including a digital volt meter (DVM) in circuit with a series of look-up read-only-memories (ROM's);

(B) I/O network for receiving said interrogation signal and connected to said DVM for generating a reset signal therefrom in response to said interrogation signal;

(C) an oscillator/ripple counter formed essentially of MSI's connected to said DVM and including at an input, a network for receiving said reset pulse from said DVM, said oscillator/ripple counter generating, in response to said reset pulse, sets of square wave pulses of differing repetition rates and pulse widths;

(D) a multiplexer and multi-segment decoder/driver means connected to each other and to (B) responding to selected sets of said square wave pulses to generate a synthetic digital code indicative of liquid level at microcircuit signal levels at an output means of said decoder/driver means;



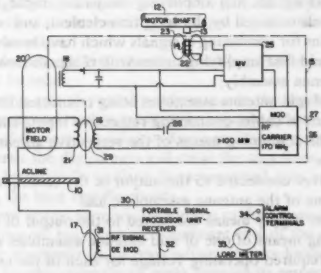
(E) isolatordriver means having one or more inputs connected to said decoderdriver means of (D, and one or more output means connected to said MARK and SPACE lines controllable as a function of said synthetic digital code to drive said MARK and SPACE lines between tank gauging operating potentials for generating said digital code of interest at said central station whereby said liquid level condition within said storage tank can be indicated.

4,194,178

ELECTRIC MOTOR WITH INTERNAL WIRELESS LOAD MONITOR

Robert F. Dumbeck, Elgin, Tex., assignor to Rexnord Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 675,780, Apr. 12, 1976, Pat. No. 4,063,112, which is a continuation-in-part of Ser. No. 548,011, Feb. 7, 1975, abandoned. This application Dec. 8, 1977, Ser. No. 858,657
Int. Cl.[2] H04B *3/56*
U.S. Cl. 340—201 R **2 Claims**



1. An electric motor load monitor comprising: a detector

and slip analysis circuit mounted within the motor housing and that produces a signal indication of motor load by slip analysis means; said slip analysis circuit further including means responsive to power line voltage variations and which corrects the motor load signal for such variations; a modulator and transmitter mounted within the motor housing that impresses a modulated motor load signal of radio frequency onto the line that supplies power to the motor for transmitting the modulated motor load signal outside the motor housing on the power line; a receiver outside the motor housing capable of receiving the modulated motor load signal impressed on the power line; and a demodulator for transforming the received signal to produce the motor load signal.

4,194,179

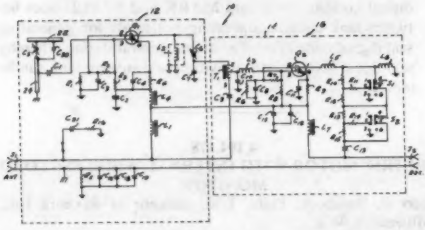
ACTIVE ANTENNA FOR MEDICAL TELEMETRY MONITORING SYSTEMS

Donald Malinouskas, Norton, Mass., assignor to Becton, Dickinson & Company, East Rutherford, N.J.

Filed Nov. 18, 1977, Ser. No. 852,954

Int. Cl.[2] **G08C** *15/00;* **H04B** *3/56;* **H04Q** *5/00*

U.S. Cl. 340—211 **19 Claims**



10. A telemetry system for monitoring the physiological condition of patients having transmitters for generating rf signals corresponding to a physiological condition, comprising:

a plurality of antenna assemblies, each of said assemblies including at least one passive reception element for receiving rf signals, first amplifying means for amplifying the rf signals received by the reception element, and combining means for combining rf signals which have been amplified by said first amplifying means with rf signals from another antenna assembly;

each of said antenna assemblies being connected in series by means of cables connecting respective inputs and outputs of the combining means of the respective antenna assemblies;

a receiver connected to the output of the combining means of one of the antenna assemblies; and

a power supply means connected to the output of the combining means of one of said antenna assemblies such that the required operating voltage for each of the series connected antenna assemblies is provided by said power source via the cables connecting the respective combining means.

4,194,180

APPARATUS FOR REGISTERING QUANTITY VALUES OF CORRESPONDING VOLUME OR ENERGY QUANTITIES BY MEANS OF COUNTERS IN A CENTRAL STATION

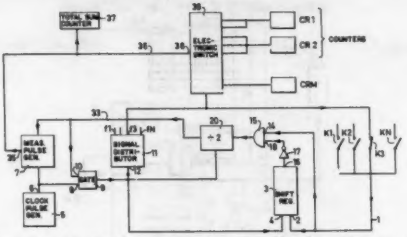
Kjell S. Norén, Stockholm, and Stig I. Karlsson, Karlskrona, both of Sweden, assignors to AB Svensk Varmemätning SVM, Bromma, Sweden

Filed Jul. 27, 1977, Ser. No. 819,439

Claims priority, application Sweden, Jul. 30, 1976, 7608653

Int. Cl.[2] **G08C** *15/06, 19/16, 25/00;* **H04Q** *9/00*

U.S. Cl. 340—183 **9 Claims**

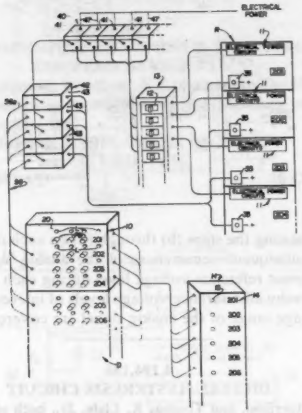


1. Apparatus for registering, by means of counters (CR1–CRN) in a central station, quantity values of corresponding volume or energy quantities measured at consumption points distant from the station, each consumption point being allocated a measuring device with a signal transmitter (K1–KN) arranged so that when said volume or energy quantity is measured the signal transmitter is put into an active state for transmitting a signal to an associated counter, said apparatus being characterized by a distributing device **(11)** stepwise controlled by clock-pulses from a clock-pulse generator **(5)**, the device having a working revolution time equal to or less than the time each signal transmitter is in an active state, and arranged for connection to the signal transmitters (K1–KN) in turn, so that when a signal transmitter in the active state is acquired, the transmitter produces an order signal to a memory device **(3)**, the order signal ordering the memory to transmit a memory signal which is stored in the memory, the memory device being arranged to store the order signal on receiving it and to transmit a memory signal indicating the state of the memory, the memory signal corresponding to the state of the activated signal transmitter at the time when it was last acquired by the distributing device; by a gate circuit means **(15; 44)** arranged to receive the order signal from the acquired signal transmitter and the memory signal transmitter by the memory device, and that if the signals indicate that the signal transmitter was in an unactivated state at the previous time that the signal transmitter was acquired by the distributing device and is then in the activated state, to generate a start signal to a measurement pulse generator **(7; 57)** for transmitting a measurement signal, and a stop signal to the distributing device **(11)** to retain it in its set position (f1–fN) corresponding to the address of the activated signal transmitter; and by a switching means **(39; 49, 50)** arranged to connect, in response to an address signal from the distributing device **(11)** corresponding to the set position of the distributing device, the counter associated with the activated signal transmitter for receiving said measurement signal from the measurement pulse generator **(7; 57)**.

4,194,181
HOTEL ROOM STATUS MONITOR AND POWER CONTROL SYSTEM

Bert W. Brundage, Columbus, Ohio, assignor to Efficiency Systems, Inc., Grove City, Ohio

Filed Nov. 28, 1977, Ser. No. 855,184
Int. Cl.[2] G08B 5/00
U.S. Cl. 340—286 R 8 Claims



1. A hotel room status monitor and power control system for a hotel having a desk clerk station and a plurality of guest room units with each room unit having an electrical power circuit; the system comprising

room power switch means interposed in circuit with an electrical power circuit of each respective room unit and an electrical power source, said switch means responsive to application of a switch control signal thereto to alternatively effect connection or disconnection of said power circuit with respect to the electrical power source,

respective room input signal means located within each room unit, each of said signal means selectively operable to provide a room input control signal,

control circuit means connected with said room power switch means and said room input signal means for each respective room unit, said control circuit means including room status indicating means located at the desk clerk station for providing indications of a plurality of room status conditions and first and second electrical switch means which are each selectively operable to provide respective first and second input switch signals to said control circuit means, said control circuit means responsive to the application thereto of first and second input switch signals and room input control signals to effect operation of said room status indicating means in providing an indication of a selected one of the plurality of room status conditions and to provide a switch control signal to said room power switch means to effect either connection or disconnection of said power circuit in accordance with a predetermined relationship to the selected room status condition.

4,194,182
ELECTRICAL SWITCH CONTROLLABLE ALTERNATIVELY BY AN INTERNAL TIMER AND BY DIGITAL INFORMATION FROM A REMOTE SOURCE

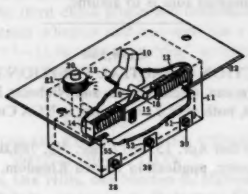
James L. Martin, 4985 Dalton Dr., Ellicott City, Md. 21045

Filed Aug. 23, 1977, Ser. No. 827,095
Int. Cl.[2] H04Q 11/04; H01H 43/02
U.S. Cl. 340—310 R 9 Claims

1. An automatically controlled electric switch adapted to be received within a wall-mounted switch body joined by electrical wiring to a source of alternating current, said switch comprising:

switching means;

a receiver responsive to digitally coded electrical information transmitted from a remote location via the electrical wiring and superimposed on the alternating current for producing an electrical signal;



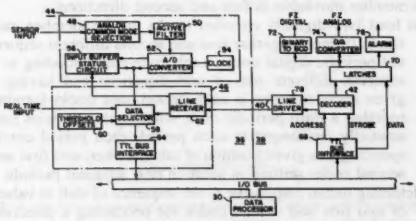
means operatively related to the receiver and said switching means for actuating the switching means in response to said signal; and

means for operating the switching means manually from outside the switch body.

4,194,183
APPARATUS FOR ELECTRICALLY CONVERTING AN ANALOG SIGNAL INTO A DIGITAL REPRESENTATION

James A. Neuner, Gibsonia; Charles W. Einolf, Jr., and Andras I. Szabo, both of Export, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 8, 1974, Ser. No. 522,190
Int. Cl.[2] H03K 13/02
U.S. Cl. 340—347 AD 1 Claim



1. Apparatus for electrically communicating information embodied in an analog signal generated at a first location to a remote second location, which maximizes noise rejection including:

an analog to digital converter situated at the first location and operable to sample the analog signal with a periodicity equal to an integral number of cycles of the power line to provide an electrical digital output representative of the samples taken;

means for transmitting the digital output to the second remote location;

a summing unit electrically responsive to the digital output at the second remote location to maintain a running digital sum of the samples taken and responsive to a reset input to transmit the digital sum and clear the sum from the unit;

means for digitally shifting the transmitted sum and dropping the least significant bit;

a random access memory responsive to the transmitted sum to store all but the least significant bits of the sum that were dropped in a corresponding memory location;

a first counter operable to cycle through its respective output states with the same periodicity as that of the samples taken;

a decoder responsive to a given output state of the first

counter to provide an output which is communicated to the reset input of the summing unit and a strobe input on the random access memory which readies the random access memory to accept the transmitted sum; and

a second counter responsive to the respective decoder outputs to cycle through its corresponding output states which are communicated to the random access memory to identify the location within the random access memory the transmitted sum is to assume.

4,194,184

BIDIRECTIONAL DIGITAL POSITION ENCODER

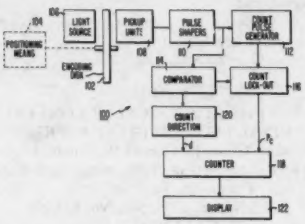
John C. Hartmann, Cedar Grove, and Nicholas F. Maxemchuk, Mercerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 15, 1977, Ser. No. 788,036

Claims priority, application United Kingdom, Apr. 30, 1976, 17962/76

Int. Cl.[2] H03K *13/00*

U.S. Cl. 340—347 P **8 Claims**



1. A bidirectional incremental digital encoder comprising:

a member moveable in first and second directions,

at least two digitally encoded tracks on the member, said tracks forming together first and second different sequential periodic digital codes, each code corresponding to a separate, different one of said directions and having a given encoded value in each period, said tracks forming together a third periodic code whose value remains substantially unchanged in each period, each period corresponding to a given position of said member, said first and second codes shifting in value in next adjacent periods,

detecting means responsive to the sequence of shift in values of said first and second codes for producing a direction signal corresponding to the movement direction of said member and responsive to said third code for producing a count signal corresponding to the number of periods traversed by said member,

count means responsive to said direction signal and said count signal for providing a member position indicating signal, and

means responsive to the order in which the codes are sensed for causing said count means to disregard a second occurring count signal produced by the same code in succession.

4,194,185

DIGITIZING A RECURRING ANALOG SIGNAL

David W. Wilson, San Jose, Calif., assignor to Gould, Inc., Cleveland, Ohio

Filed Feb. 24, 1978, Ser. No. 881,060

Int. Cl.[2] H03K *13/04*

U.S. Cl. 340—347 AD **13 Claims**

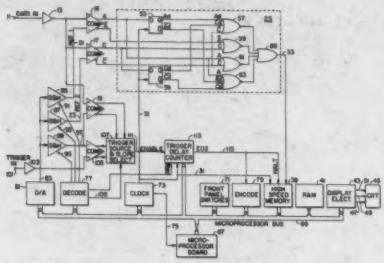
1. A method of digitizing a repetitive analog signal, comprising the steps of:

(a) establishing a first reference voltage level and selecting a first occurrence of said analog signal,

(b) comparing the signal level of said occurrence of said analog signal with said reference voltage level,

(c) developing at each of a plurality of instants during said occurrence of the analog signal a separate digital bit whose state is a function of the relative magnitudes of the reference voltage and the analog signal at each such instant,

(d) storing said digital bits, and



(e) repeating the steps (b) through (d) on each of a plurality of subsequent occurrences of the analog signal with a different reference voltage level during each occurrence, whereby all reference voltage levels of interest within the voltage range of the analog signal are covered.

4,194,186

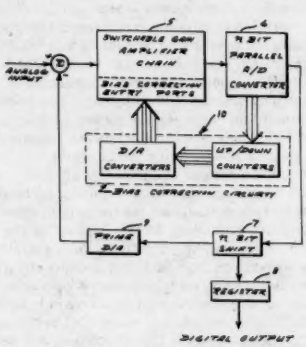
DIGITAL HYSTERESIS CIRCUIT

Steven Morrison, and Thomas K. Lisle, Jr., both of Baltimore, Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 20, 1978, Ser. No. 898,067

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 AD **2 Claims**



1. In a successive ranged analog/digital converter having a switchable gain amplifier chain and an n bit parallel analog/-digital converter, the improvement of an automatic bias adjustment circuit with hunting elimination means, said automatic bias adjustment circuit comprising

a first up/down counter means for counting between extremum states in response to enable and up/down input signals and having a pre-set state intermediate said extremum states, said first up/down counter means generating an enable output pulse and a reset pulse for each extremum state count,

means for re-setting said first up/down counter means to said pre-set state in response to each said reset pulse,

a second up/down counter means receiving enable pulses from said first up/down counter means,

digital/analog converter means driven by said second up/-down counter means and providing bias correction signals in response thereto,

a logic circuit for developing from said n bit parallel analog/digital converter first and second logic functions, said logic functions defining a given sub-range, and

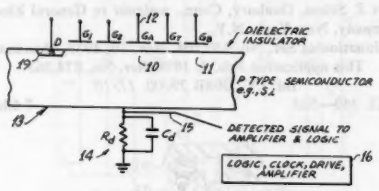
up/down counter actuating means receiving said first and second logic functions and clock signals, said actuating means enabling said first up/down counter means in response to said first logic function and effecting counting thereby in a direction dictated by the state of said second logic function.

4,194,187

ANALOG-TO-DIGITAL CONVERSION BY CHARGE COUPLED DEVICE

William B. Glendinning, Red Bank, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 7, 1978, Ser. No. 931,638
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 AD **10 Claims**



1. An analog-to-digital converter which is an integrated circuit charge coupled device having a substrate and a pair of charge packet potential wells comprising a first well and a second well for converting an analog signal to an M-bit binary code, said wells having first and second holding gates respectively;

input means to insert charge packets representing analog values of samples of the input analog signal into said first well;

transfer means including a transfer gate to transfer charge packets from the first well to the second well and from the second well to the first well;

substrate detection means for output of "one" or "zero" values for the M-bits of each sample

control means comprising logic, drive, and clock circuits coupled to said holding gates, to said input means, to said transfer gate, and to said detection means, with the clock circuits providing clock signals in repetitive cycles to convert one sample per cycle, each cycle being divided into an input subcycle plus M conversion subcycles of three phases each; the conversion subcycles being designated by the sumbol K, with the first conversion subcycle having K=M, the second K=M−1, and K decreasing by 1 until its value is 1 for the Mth conversion subcycle;

the converter being operative during the first conversion subcycle following the input subcycle to place a voltage of (2^m-1) units (the voltage units being of a fixed predetermined value) on both of said holding gates during the first and second clock phases and a voltage of $(2^{m-1}-1)$ units during the third clock phase, and to place a voltage of (2^m-1) units on the transfer gate during the second clock phase, so that the full analog charge packet representing the input sample is in the first well during the first clock phase, and any charge in excess of (2^{m-1}) is transferred to the second well during the second clock phase, then during the third clock phase said detection means is actuated to detect whether the first well has a charge in excess of $(2^{m-1}-1)$ to output a "one" or otherwise to output a "zero";

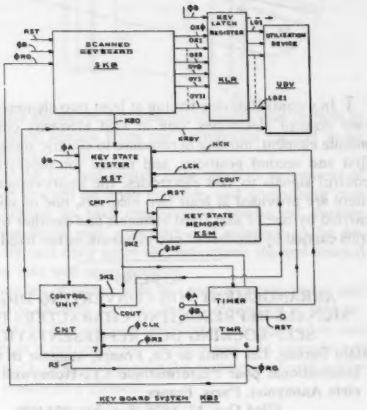
the converter being further operative during subsequent conversion subcycles to place a voltage of $(2^{k-1}-1)$ units on both of said holding gates during the first and second clock phases and a voltage of $(2^{K-1}-1)$ units during the third clock phase, except that if the bit output in the preceding subcycle was a "one" then the voltage on the holding gate is changed to zero during the first clock phase for that well which produced the output signal to dissipate its charge into the substrate, so that at the end of the first clock phase only one well of said pair contains a charge packet, and any charge in excess of (2^{k-1}) is transferred to the other well during the second clock phase, then during the third clock phase said detection means is actuated to detect whether said one well has a charge in excess of $(2^{k-1}-1)$ to output a "one" or otherwise to output a "zero".

4,194,188

INTERROGATION OF KEY SWITCHES USING PULSE WIDTH DETECTION

Francis C. Marino, Dix Hills, and Morton B. Herman, Queens Village, both of N.Y., assignors to Redactron Corporation, Hauppauge, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,526
Int. Cl.[2] G08C *25/00*; G06F *3/02*
U.S. Cl. 340—365 E **15 Claims**



12. A keyboard system comprising: a plurality of key switch means, each of said key switch means having a movable key, an input adapted to receive sampling pulses of a first given width, an output for emitting pulses of different widths and pulse-width modulating means connected to said movable key and connecting said input to said output for transmitting a pulse to said output in response to a pulse received at said input, the emitted pulse having a width which is a function of the travel of said movable key; a pulse generator means emiting a single sampling pulse to the input of each of said key switch means sequentially; low sensing means connected to the output of each of said key switch means for giving a low-key indication whenever a pulse having a width greater than a second given width which is less than said first given width is emitted from the output of the key switch means whose input is then receiving a pulse of said first given width from said pulse generator means; stalling means responsive to said low-key indication for stalling said pulse generator means on the input of the key switch means whose output activated said low sensing means whereby pulses of said first given width are continuously fed to said input; delay means responsive to said low-key indication for deactivating said stalling means for a given time interval which is a multiple of said first given width, after the activation of said stalling means whereby said pulse generator resumes emitting a single pulse to the input of each of said key switch means sequentially; and indicating means responsive to said

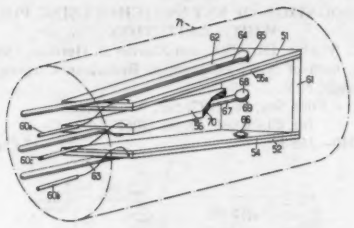
delay means for emitting a depressed-key indication that a key switch has reliably operated if a low key indication is received at the end of said given time interval.

4,194,189

CONTROL DEVICES OF THE RELAY TYPE

Jacques Lewiner, Saint-Cloud; Gerard Dreyfus, Villebon sur Yvette, and Didier Perino, Suresnes, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Mar. 29, 1978, Ser. No. 891,466
Claims priority, application France, Apr. 5, 1977, 77 10323
Int. Cl.[2] G08B 5/00
U.S. Cl. 340—373 **11 Claims**



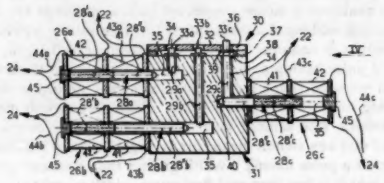
1. In a control device having at least two elements including two control electrodes, one of said elements comprising a mobile element, moving in response to electric signals between first and second positions, and means for supplying electric control signals to said electrodes, the improvement wherein there are provided at least two electrets, one of said electrets carried by one of said fixed elements and another of said electrets carried by another of said elements, either fixed or mobile.

4,194,190

ARRANGEMENT FOR CONVERTING DIGITAL SIGNALS REPRESENTING CHARACTERS INTO A SELF-LOCKING DOT REPRESENTATION

Alain Bareau, Les Ponts de Ce, France, assignor to Compagnie International pour l'Informatique C11-Honeywell Bull (Societe Anonyme), Paris, France

Filed Oct. 17, 1978, Ser. No. 952,079
Claims priority, application France, Oct. 11, 1977, 77 34053
Int. Cl.[2] G09B 21/00
U.S. Cl. 340—407 **12 Claims**



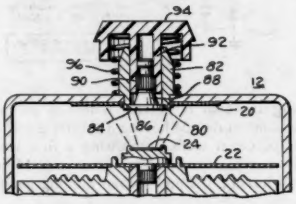
1. Apparatus for converting digital electrical signals representing characters into a particular pattern of dots symbolizing each of the said characters which pattern of dots project from a given surface of a module and which pattern of dots are selected from a given number of dots in a predetermined grid, comprising at least one group of stems having first ends arranged to form the said given number of dots in a predetermined grid, a plurality of coil means supported to said module and responsive to the said electrical signals to cause said stems to project, selectively from the said given surface, said module having a plurality of wells and a plurality of cavities, each of the said stems being mounted to slide in an associated well which opens substantially orthogonally into an associated cavity, a plurality of plunger cores each being disposed to slide in an associated cavity, each plunger core having a first end adapted to be subjected to a magnetic write flux which propels the said plunger core in a given direction and to a magnetic clearing flux which moves said plunger core in the opposite direction, said fluxes being generated respectively by at least one of the said coils in response to the said electrical signals and a clearing signal respectively, and each plunger core having a second end cooperating with the second end of the associated stem to cause the stem to be raised so that its first end projects above the given surface of the module in response to the said magnetic write flux, and to maintain said first end projecting until the said first end of said plunger core is subjected to a clearing flux.

4,194,191

SMOKE SIMULATING TEST APPARATUS FOR SMOKE DETECTORS

Robert J. Salem, Danbury, Conn., assignor to General Electric Company, New York, N.Y.

Continuation of Ser. No. 630,204, Nov. 10, 1975, abandoned.
This application Feb. 1, 1978, Ser. No. 874,363
Int. Cl.[2] G08B 29/00, 17/10
U.S. Cl. 340—515 **7 Claims**



1. A smoke detector of the ionization type comprising:
a measuring chamber having an interior substantially freely accessible to airborne products of combustion,
first and second spaced-apart electrodes within said measuring chamber,
a source of alpha radiation for ionizing air between said first and second electrodes such that current flows between said electrodes when appropriate voltage is applied across said first and second electrodes,
alarm means coupled to said measuring chamber for producing an alarm signal when the electrical resistance of said measuring chamber is consistent with the presence within said measuring chamber of a predetermined level of airborne products of combustion, and
test apparatus comprising:
intercepting means within said measuring chamber movable between a first neutral position and a second position closer to said source of alpha radiation for intercepting alpha particles, said intercepting means being separate from said source of alpha radiation and being electrically insulated from each of said first and second electrodes at least when said intercepting means is in said second position, and
manually operable means coupled to said intercepting means for moving said intercepting means between said first and second positions to increase the electrical resistance between said first and second electrodes,
the size of said intercepting means and the location of said second position being such that the electrical resistance between said first and second electrodes when said intercepting means is in said second position is substantially identical to the electrical resistance between said first and second electrodes when said intercepting means is in said first position and said predetermined

level of airborne products of combustion is present within said measuring chamber,

whereby the presence within said measuring chamber of said predetermined level of airborne products of combustion may be simulated by moving said intercepting means to said second position so as to test the responsiveness of said alarm means.

4,194,192

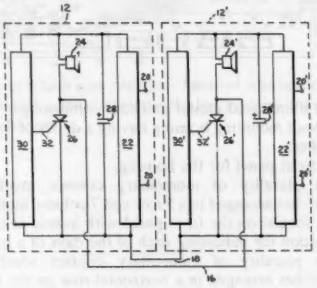
ALARM DEVICES FOR INTERCONNECTED MULTI-DEVICE SYSTEMS

Harry Albinger, Jr., Monroe, Conn., assignor to General Electric Company, New York, N.Y.

Filed Dec. 11, 1978, Ser. No. 968,514

Int. Cl.[2] G08B *17/10, 23/00, 3/10*

U.S. Cl. 340—517 **9 Claims**



1. An alarm device adapted for use in a multidevice alarm system, said alarm device comprising:

terminal means for connection to a source of electric power;

an alarm circuit coupled to said terminal means, said alarm circuit comprising normally conductive alarm means connected in series with normally non-conductive (OFF) switching means;

energy storage means coupled to said terminal means, said energy storage means connected in series with said alarm circuit and said energy storage means having sufficient electrical energy storage capacity to operate said alarm means for a discernable period of time;

control means coupled to said terminal means and said switching means for sensing an adverse condition and supplying an output signal to said switching means in response thereto, said switching means switching to a conductive state (ON) only while an output signal is supplied thereto; and

circuit means connected to said switching means for permitting the interconnection of said switching means in parallel with the switching means of one or more other alarm devices such that a source of electric power connected to the terminal means of at least one interconnected alarm device will charge the energy storage means of all of the interconnected alarm devices, whereby the alarm means of all of the interconnected alarm devices will operate in response to the sensing of an adverse condition by any one of the inter-connected alarm devices.

4,194,193

SELF-CONTAINED DOOR ALARM DEVICE

Larry McDonough, 529 E. Florence, West Covina, Calif. 91790

Filed Nov. 25, 1977, Ser. No. 854,646

Int. Cl.[2] G08B *13/08*

U.S. Cl. 340—545 **12 Claims**

1. A self-contained alarm device, adapted to provide an audible signal upon the opening of a door, comprising:

enclosure means comprising a mounting plate adapted to be secured to the door frame above said door,

a DC power source, secured within said enclosure,

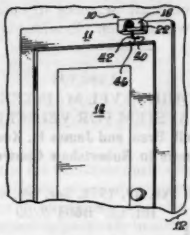
an electrically powered sound signal source for said audible signal, adapted to be powered from said DC power source and connected thereto by means of an electrically conducting path,

a switch in said conducting path adapted to interrupt current flow in said path with the door in a closed position,

said switch comprising an electrically conductive planar element proximate to, and insulated from, the inner face of said enclosure at the basal surface thereof,

coaxial orifices in said conductive element and said basal surface, with the orifice in the latter increased in size with respect to the orifice in the former,

a cantilevered conductor depending from a fixed anchor



within said enclosure and passing through said orifices in an alignment spaced from the peripheries thereof in an unloaded state, and

actuator means for said switch responsive to movement of said door toward an open position, and comprising cam means affixed to said cantilevered conductor, further depending from said enclosure and adapted to be entrained by said door upon the movement thereof toward said cam into said open position,

wherein one leg of said conductive path is terminated at said conductive element and one leg is terminated at said anchor, thereby allowing current flow in said path when said cam means is entrained by the door and said cantilevered conductor is deflected against the perimeter of said orifice in said conductive element.

4,194,194

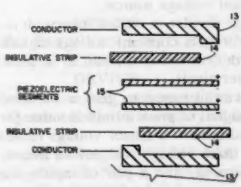
PIEZOELECTRIC VIBRATION DETECTOR FOR SENSING A NEARBY INTRUDER

John T. Redfern, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 30, 1978, Ser. No. 873,200

Int. Cl.[2] G08B *13/00;* **H01L** *41/10;* **H04R** *17/00*

U.S. Cl. 340—566 **2 Claims**



1. An apparatus for sensing a mechanical vibration which is representative of a nearby intruder comprising:

an elongated sheath;

a pair of top and bottom elongated conductors located within the sheath and extending therealong in a vertically spaced apart relationship;

a layer of segments of piezoelectric film mounted in a longitudinally spaced apart relationship between said pair of conductors;

a strip of insulative material mounted between the top conductor and a top side of each piezoelectric segment, and another strip of insulative material mounted between the bottom conductor and the bottom side of each piezoelectric segment;

the strips of insulative material being offset from opposite edges of the layer of piezoelectric segments;

each conductor having an inwardly extending projection within the respective offset of insulative material to electrically connect with respective top and bottom portions of each piezoelectric segment; and

the piezoelectric segments being arranged in an alternately polarized relationship along the sheath,

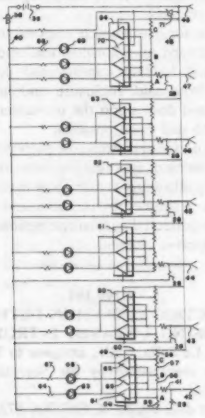
whereby nearby vibrations of an intruder will activate the closest piezoelectric segment to cause a signal on the conductors while distant vibrations will be nullified.

4,194,195

PORTABLE LIQUID LEVEL MAINTENANCE MONITOR SYSTEM FOR VEHICLES

Kenneth C. Merrell, Brea, and James H. Koegel, Placentia, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 27, 1978, Ser. No. 872,898
Int. Cl.[2] B60T *8/00*
U.S. Cl. 340—661 **10 Claims**



1. A monitoring circuit to detect changes in a sensed condition which comprises:

(1) a constant voltage source;

(2) a voltage divider in circuit therewith to develop at least three reference, constant voltage signals of distinct and predetermined values at each of at least three reference voltage terminals,

(3) sensor circuit means to generate a condition responsive voltage signal of predetermined value for each of at least four conditions at a sensor voltage terminal;

(4) at least three voltage comparator means, each having an output terminal and a pair of inputs, one in circuit to a respective one of said reference voltage terminals and the other to said sensor voltage terminal; and

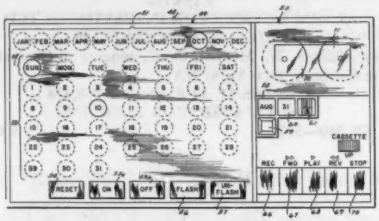
(5) at least two output circuit means including respective indicators, one indicator in circuit to the output terminal of two of said voltage comparator means and the remaining indicators each in circuit to respective single output the output terminal of a respective one of the remaining voltage comparator means.

4,194,196

ILLUMINATED MASTER CALENDAR AND MESSAGE RECORDING SYSTEM

Mohammed S. Mohiuddin, 920 W. Lakeside, Apt. 1511, Chicago, Ill. 60640

Filed Oct. 25, 1977, Ser. No. 845,047
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—711 **9 Claims**


JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
SUN MON TUE WED THU FRI SAT
AUG 31
CASSETTE
REC FWD PLAY REV STOP
RESET ON OFF FLASH

1. An illuminated master calendar comprising:

(a) a wall mounting housing having a depth of less than two inches;

(b) a front panel for the housing;

(c) a plurality of momentary contact touch sensitive switches arranged in a 5 row and 7 column monthly calendar format on the front panel with indicia at each switch location for indicating each of the days of a month;

(d) a plurality of momentary contact touch sensitive switches arranged in a horizontal row on the front panel with indicia at each switch location for indicating each of the months of a year, and an additional horizontal row of touch sensitive switches with indicia at each switch location for indicating days of the week in alignment with the 7 columns of the calendar format;

(e) a reset switch on the front panel;

(f) illuminator means directly at each switch for illuminating only the associated indicia directly at the switch;

(g) circuit means for illuminating the illumination means when the corresponding switch is touched and maintaining the illumination after the switch is released; and

(h) reset circuit means connected to said reset switch for controlling said circuit means so as to extinguish all illuminated illumination means and prepare each of said illumination means for reactivation by corresponding touch sensitive switches.

4,194,197

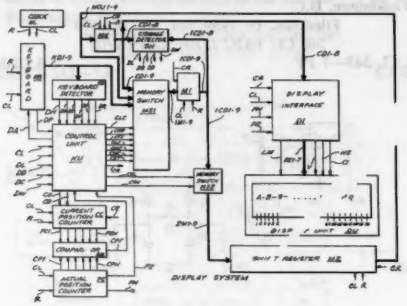
AUTOMATIC CENTERING OF CHARACTER STRINGS

Leslie J. Bodin, Stonybrook, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 832,280, Sep. 12, 1977, Pat. No. 4,139,902. This application Sep. 18, 1978, Ser. No. 943,049
Int. Cl.[2] G06K *15/18*
U.S. Cl. 340—711 **3 Claims**

1. In a word processor wherein data characters entered serially via a keyboard are displayed by a display device serially in a plurality of positions along a line of a record medium, the method of centering a set of data characters about a particular point on the line of the record medium comprising: the steps of providing a storage medium having a plurality of addressed cells wherein the addresses continuously range from a first value to a second value; serially assigning the cells to the positions of the record medium; selecting the cell assigned to the position which includes the particular point on the line; loading the first data character of the set in said cell; for all subsequent pairs of data characters of the set, loading one data character of the data character pair in the memory cell having an address one unit closer to said first value than the address of the memory cell in which the previous data character was loaded and for the other character of the pair, shifting the

contents of each of the memory cells storing a loaded data character to the memory cell having an address one unit closer to said second value and loading said other character into the



memory cell in which said one data character was loaded; and serially transmitting the contents of the loaded memory cells to said display device.

4,194,198

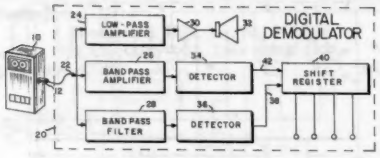
DIGITAL PREPROGRAMMED TELEVISION GAME SYSTEM

Ralph H. Baer, Manchester, and Leonard D. Cope, Nashua, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Continuation of Ser. No. 679,301, Apr. 22, 1976, abandoned. This application Jul. 3, 1978, Ser. No. 922,451

Int. Cl.² G06K *15/20*

U.S. Cl. 340—724 **25 Claims**



1. Apparatus for playing games on the screen of a television type receiver, comprising:

at least one symbol generator for generating signals which when coupled to a television type receiver will display on the screen of the receiver a symbol which is moveable over the screen of the receiver to play games;

a prerecorded audio frequency magnetic recording means having bits of binary coded digital data recorded thereon, said bits comprising instructions to affect the position of the symbol on the screen of the receiver; and

a demodulator coupled to said prerecorded audio frequency recording means having a plurality of outputs coupled to said symbol generator, each of said outputs providing instruction regarding a different positioning of the symbol on the screen of the receiver.

4,194,199

DISPLAY APPARATUS

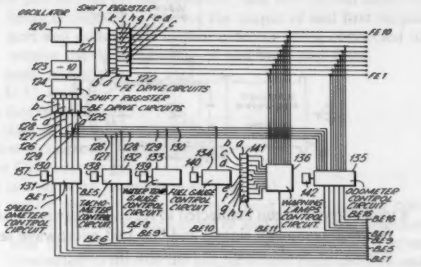
Brian Shepherd, Witney, and Richard N. Thomas, Weybridge, both of England, assignors to Smiths Industries Limited, London, England

Filed Apr. 4, 1977, Ser. No. 784,304

Claims priority, application United Kingdom, Apr. 6, 1976, 13987/76

Int. Cl.² G06F *3/14*

U.S. Cl. 340—754 **17 Claims**



1. Display apparatus for simultaneously displaying the values of a plurality of different physical parameters, said apparatus having a plurality of electrically-operable display regions which are to be operated respectively in accordance with said different physical parameters to display respectively the values of those physical parameters, the said display regions each comprising a plurality of display sections disposed in spaced array, an electrode which is common to all display sections in that display region, and a plurality of individual electrodes defining individual and respective ones of the display sections in that display region, the electrodes of the said plurality of individual electrodes associated with the display region for one of said physical parameters being coupled to respective ones of the said plurality of individual electrodes associated with another display region for another one of said physical parameters to form respective groups of electrodes which respectively interconnect display sections associated with different ones of said plurality of physical parameters, and circuit means comprising first means for energizing the said groups of electrodes in a repeated fixed sequence and second means for energizing the said common electrodes in synchronism with the number of the repetition of said fixed sequence in a display cycle, said second means including a plurality of individual control means at least two of which are operable during each repetition of said fixed sequence, each of said control means being associated with a respective one of said plurality of physical parameters and being operable to control the energization of the common electrodes of the display region appropriate to that physical parameter in accordance with an input signal representative of the value of the physical parameter.

4,194,200

COMBINED RECEIVER PROTECTOR, AGC ATTENUATOR AND SENSITIVITY TIME CONTROL DEVICE

Harry Goldie, Randallstown, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 801,714, May 31, 1977, abandoned. This application Nov. 1, 1978, Ser. No. 956,704

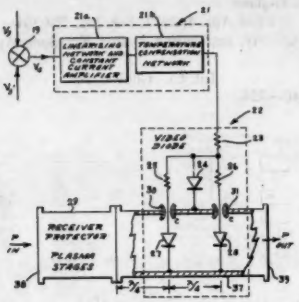
Int. Cl.² G01S *7/34*

U.S. Cl. 343—5 SM **9 Claims**

1. In combination with a radar having various discrete system function command signals, a combined radar receiver protector and system function command signal implementing device comprising

a high power plasma stage,

a transmission line section connected thereto having microwave semiconductor diode means connected thereacross, system function command signal linearizing means, and



a video driver circuit connected to receive linearized system function command signals and bias said microwave semiconductor diode means in response thereto.

4,194,201

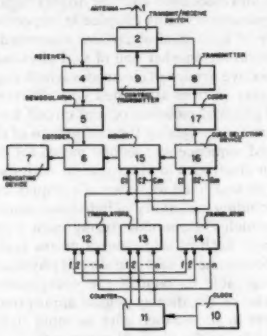
INTERROGATOR-RESPONSOR SYSTEM

Hans-Jürgen Stein, Eichenau, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 76,272, Sep. 23, 1970, abandoned. This application Jul. 23, 1973, Ser. No. 385,593

Int. Cl.[2] G01S *9/56*

U.S. Cl. 343—6.5 LC **5 Claims**



1. The combination of an interrogator which permits the transmission of different interrogation codes and at least one answering device which upon agreement with a previously received code transmits an answering signal, said interrogator having means for generating a plurality of different interrogation codes simultaneously, means for transmitting a number m of said codes in sequence, means for continuously changing the interrogator and answering codes according to a time distribution program, a memory in said interrogator for storing the code sequence transmitted to said answering device, said answering device reacting only to m-p of the transmitted interrogation codes, where $p \geq 1$ and is an integer, means in said interrogator for receiving and decoding answering signals, said decoding means in the interrogator being connected to said memory for comparing the interrogator codes stored in said memory with the sequence of codes of the answering signal.

4,194,202

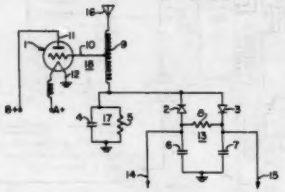
GRID PULSED OSCILLATOR AND DETECTOR

William E. Doyle, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 16, 1959, Ser. No. 840,479

Int. Cl.[2] F42C *13/04*; G01S *9/02*

U.S. Cl. 343—7 PF **5 Claims**



5. A pulse doppler proximity fuze comprising a self-pulsing oscillator for developing a series of radio frequency electromagnetic energy impulses, an antenna electrically connected to said oscillator for radiating said impulses into space and for intercepting reflected impulses thereby to effect a variation in the amplitude of said impulses, a pair of detectors electrically connected to the said oscillator circuit for developing an output signal in proportion to the energy of the said reflected signal during the peak amplitude of said impulse, a thyratron firing circuit said detectors having means for detecting spurious signals and target signals but utilizing only the target signals for firing the thyratron firing circuit; and an electroresponsive ignition device electrically coupled to the thyratron firing circuit, said device being ignitable upon actuation of the thyratron firing circuit by said target signal.

4,194,203

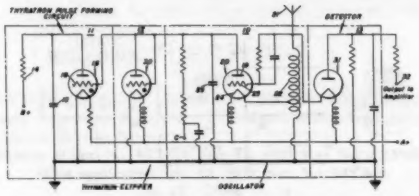
PULSE DOPPLER-RADIO PROXIMITY FUZE

John H. Kuck, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 14, 1951, Ser. No. 210,851

Int. Cl.[2] F42C *13/04*

U.S. Cl. 343—7 PF **3 Claims**

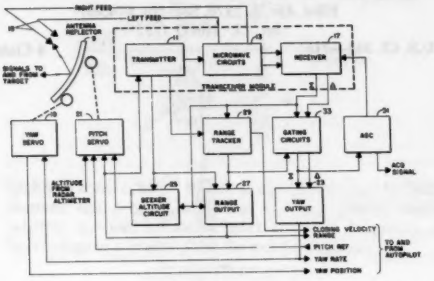


1. A radio proximity fuze comprising, an oscillator for generating radio frequency waves, an antenna for propagating said generated waves through space and for receiving waves reflected from a target and propagated through space toward said antenna, a detector for rectifying said generated waves and said received waves, an output connection to said detector for utilizing the detector output to fire said fuze, means for periodically supplying power to said radio frequency oscillator, said power means including a thyratron relaxation oscillator and a connection from said relaxation oscillator to said radio frequency oscillator, and means for rendering said detector insensitive to received waves during periods of non-operation of said oscillator whereby said fuze is afforded protection against jamming by remotely situated radio transmitters.

4,194,204
HIGH RESOLUTION MICROWAVE SEEKER

Frederick C. Alpers, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 5, 1972, Ser. No. 260,703
Int. Cl.[2] G01S 9/22, 9/233
U.S. Cl. 343—7.4 8 Claims



1. In a high resolution microwave seeker, the combination comprising:

(a) antenna means for transmitting and receiving microwave signals in the direction of a target of interest,

(b) microwave transceiver means coupled to said antenna means for supplying signals controlled in pulse width and frequency for transmission and for processing received signals to generate a normalized yaw control signal,

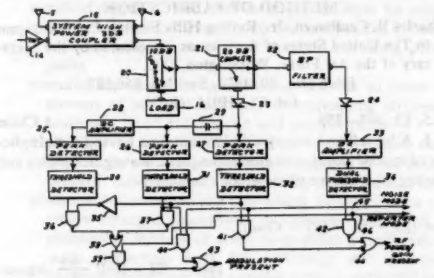
(c) yaw control circuit means coupled to said transceiver and to said antenna for controlling the aim point of said antenna in the yaw plane,

(d) pitch control circuit means including range and altitude circuit means coupled to said transceiver and to said antenna for controlling the aim point of said antenna in the pitch plane.

4,194,205
R.F. POWER AND VIDEO MODULATION MONITORING CIRCUIT FOR COUNTERMEASURES SYSTEM

Robert R. Willmore, Millersville, and William B. McCartney, Odenton, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 6, 1978, Ser. No. 868,969
Int. Cl.[2] G01S 7/38, 7/40; H04K 3/00
U.S. Cl. 343—17.7 3 Claims



1. In an electronic countermeasures system adapted to function in either a noise jamming mode or a repeater mode and in which the system is operated in frequency bands selected from a multiplicity of frequency bands the improvement comprising a system monitoring circuit, said monitoring circuit including

a first coupling means connected to couple a portion of the power from said countermeasures system,

a second coupling means having an input port and first and second output ports, said second coupling means being connected to receive power from said first coupling means,

a band pass filter having a band pass frequency centered on the center frequency of an unused system frequency band said filter being connected to receive the output of said second output port,

first and second crystal detectors, said first crystal detector being connected to receive the output of said first output port and said second crystal detector being connected to receive the filtered output of said band pass filter,

a peak detector,

a D.C. amplifier,

a threshold detector,

a dual threshold threshold detector,

first and second Nand gates,

an OR inverter gate,

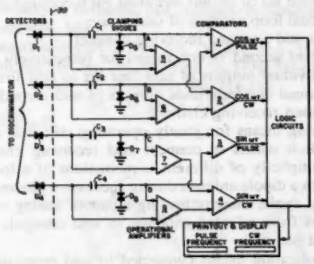
a system noise jamming mode bus, and

a system repeater mode bus, said peak detector being connected to receive the output of said first crystal detector, said first mentioned threshold detector having its input connected to receive the output of said peak detector and its output connected to a first input of said first Nand gate, said DC amplifier being connected between said second crystal detector and said dual threshold threshold detector, the output of said duel threshold detector being connected to a first input of said second Nand gate, said system noise jamming mode bus being connected to a second input of said first Nand gate, said system repeater mode bus being connected to a second input of said second Nand gate, and the outputs of said first and second Nand gates being connected to first and second inputs of said OR inverter gate.

4,194,206
INSTANTANEOUS FREQUENCY MEASUREMENT (IFM) RECEIVER WITH CAPABILITY TO SEPARATE cw AND PULSED SIGNALS

James B. Y. Tsui, Centerville, and Gerd H. Schrick, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 22, 1978, Ser. No. 240
Int. Cl.[2] G01S 7/36
U.S. Cl. 343—18 E 2 Claims



1. The improvement in an instantaneous frequency measurement (IFM) receiver to provide frequency measurement of simultaneously received pulse and continuous wave (cw) signals, the said receiver having receiving means including a phase discriminator and detectors providing outputs represented by $1+\cos \omega\tau$, $1-\cos \omega\tau$, $1+\sin \omega\tau$, and $1-\sin \omega\tau$ of the received signals, the said improvement comprising:

a. a first means cooperating with the outputs of the said diode detectors for providing a pulse signal path that

generates a first output signal represented by sin $\omega\tau$ of the said received pulse signals and a second output signal represented by cos $\omega\tau$ of the said received pulse signals:

b. a second means cooperating with the outputs of the said diode detectors for providing a cw signal path that generates a first output signal represented by sin $\omega\tau$ of the said received cw signal and a second output signal represented by cos $\omega\tau$ of the said received signal;

c. means cooperating with the said first and second output signal of the said first means and the said first and second output signal of the said second means for providing the said frequency of the said received pulse signal and the said frequency of the said simultaneously received cw signal.

4,194,207

RADIOLOCATION SYSTEM FOR DETERMINING THE DIRECTION OF INCIDENT ELECTROMAGNETIC WAVES

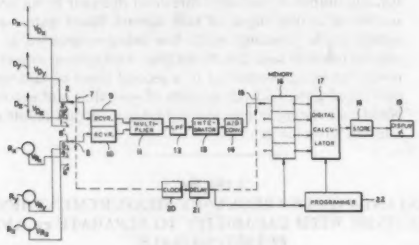
Hermann Zaüscher, Wörthsee, Fed. Rep. of Germany, assignor to C. Plath GmbH Nautisch Elektronische Technik, Hamburg, Fed. Rep. of Germany

Filed May 4, 1978, Ser. No. 902,821

Claims priority, application Fed. Rep. of Germany, May 5, 1977, 2720222

Int. Cl.[2] H04B *7/00*

U.S. Cl. 343—120 **3 Claims**



1. In a radiolocation system, in combination:

an antenna array adapted to intercept incident electromagnetic waves, said array comprising three loop antennas in mutually orthogonal planes and three dipole antennas extending along the intersections of said planes;

a first set of output terminals each connected to an individual dipole antenna of said array;

a second set of output terminals each connected to an individual loop antenna of said array;

a first and a second receiving channel;

first and second switch means for respectively connecting individual outputs of said first set to said first receiving channel and individual outputs of said second set to said second receiving channel;

scanning means for jointly operating said first and second switch means to connect said receiving channels to a multiplicity of different combinations of a loop antenna with a dipole antenna during successive phases of a recurrent cycle, thereby feeding a pair of analog output voltages from selected antennas to said channels in each of said phases;

multiplication means connected to said receiving channels for forming the product of said pair of output voltages in each phase, said multiplication means comprising a multiplier, a low-pass filter and an integrator in cascade;

a memory with a multiplicity of stages respectively assigned to said different combinations;

third switch means controlled by said scanning means for sequentially connecting said multiplication means to said stages, thereby loading same with the voltage products obtained in respective phases; and

arithmetic means connected to said memory for algebraically combining the voltage products loaded into said stages in each cycle to derive directional data therefrom.

4,194,208

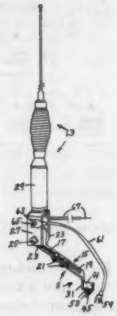
SWINGABLE SUPPORT FOR CONCEALABLY MOUNTING ANTENNAS ON VEHICLES

Steven Eveloff, Springfield, Ill., assignor to Shur-Lok Manufacturing Co., Inc., Hutchins, Tex.

Filed Apr. 8, 1976, Ser. No. 674,957

Int. Cl.[2] H01Q *1/32*

U.S. Cl. 343—715 **4 Claims**



1. A support for concealably mounting an antenna to an automotive vehicle having a relatively large compartment with a readily movable closure, said support comprising: a stationary member adapted for semi-permanent interior concealed attachment to vehicle structure defining the access opening of said compartment, and a movable antenna-supporting member swingably connected to said stationary member, whereby said movable member and its attached antenna can be readily swung between an exposed normal-use position and a completely concealed under-cover non-use position, said stationary member being a relatively small plate mountable flatly on the top side of the bottom of a conventional rain-channel, and said movable member being an L-shaped strap whose upright reach is adapted to extend upwardly through the usual narrow gap between a compartment closure member and adjacent vehicle structure, and whose horizontal reach is hinged at its end edge to said stationary small plate.

4,194,209

BROADBAND WAVEGUIDE LENS ANTENNA AND METHOD OF FABRICATION

Charles B. Coulbourn, Jr., Rolling Hills Estates, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 30, 1977, Ser. No. 866,187

Int. Cl.[2] H01L *19/06*

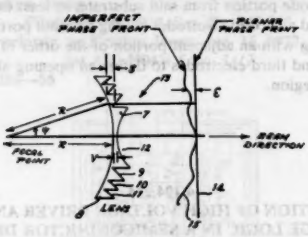
U.S. Cl. 343—753 **1 Claim**

1. A broadband waveguide lens antenna having a multiplicity of spaced juxtaposed electromagnetic waveguide plates and having an aperture phase error characteristic

$$\epsilon = |[(S - V) - R(1 - \cos\psi)] - [\eta(S - V)] + [J\lambda]| \frac{360}{\lambda} \text{ degrees,}$$

wherein R=focal length, ψ=angle at intersection of general ray and antenna axis, S=lens thickness at point of general ray passage, V=lens thickness along its axis, η=lens refractive axis, V=zone number, λ=free space wavelength, each waveguide plate being formed to have multiple steps, each said step

defining a zone and being configured and dimensioned such that the componenets of phase error due to waveguide plate dispension ϵ_n is equal to and opposite the components of phase error due to waveguide plate geometric configuration ϵ_u for



each said zone, ϵ_n being defined as $\epsilon_n=(S-V)(\eta_o-\eta)(360/\lambda)$ degrees, and ϵ_j being defined as $\epsilon_j(\lambda-\lambda_o)(360/\lambda)$ degrees, wherein η_o=lens refractive index at design frequency, and λ_o=freespace wavelength at the design frequency.

4,194,210

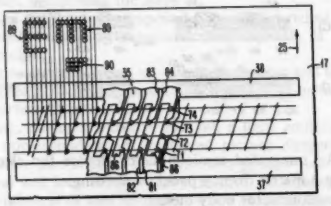
MULTI-NOZZLE INK JET PRINT HEAD APPARATUS

Konrad A. Krause, Mountain View, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 671,920, Mar. 29, 1976, abandoned. This application Jan. 23, 1978, Ser. No. 871,299

Int. Cl.² G01D *15/18*

U.S. Cl. 346—75 **8 Claims**



1. An ink jet head for producing a plurality of parallel streams of uniformly sized ink drops for selective deposition on a recording medium during relative movement between said medium and said head comprising:

a plurality of rows of nozzles, each row arranged diagonally with respect to the direction of said relative movement and in a plane parallel to said recording medium;

manifold means for said nozzles having an input for supplying pressurized ink from a source to said nozzles to project a stream of ink from each of said nozzles along parallel paths;

perturbation means for perturbating said ink to cause said streams of ink to break into corresponding streams of uniformly sized drops along said parallel paths;

a plurality of rows of charge electrodes arranged correspondingly with said nozzles and disposed at the point of breakoff of said drops for selectively charging said drops;

common deflection means comprising two deflection electrodes arranged respectively on opposite sides of all said plurality of streams of drops to establish a single electrostatic deflection field for deflecting said selectively charged drops from said parallel paths to deflected paths; and

gutter means arranged to catch said drops in one of said sets of paths to prevent their impacting said recording medium, whereby said drops in the other of said sets of paths impact said recording medium to produce a plurality of spaced marking on said medium.

4,194,211

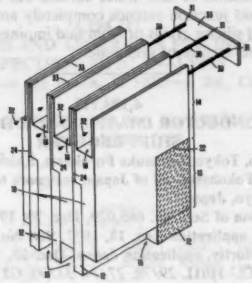
CHARGE ELECTRODE ARRAY FOR MULTI-NOZZLE INK JET ARRAY

Arthur R. Hoffman, Longmont, and Gerald B. Lammers, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 19, 1978, Ser. No. 917,144

Int. Cl.² G01D *15/18*

U.S. Cl. 346—75 **19 Claims**



1. In an ink jet printer an array of electrodes for charging ink drops comprising:

a plurality of electrically conductive charge electrodes, each electrode having a base portion and a head portion;

a substrate of nonconductive material with grooves of substantially the same width as the base portion of said electrodes for supporting each of said electrodes with the head portion above the surface of the substrate when the base portion rests in a groove and said grooves positioned a distance apart greater than the width of the head portion of the electrodes so that there is a separation space between the head portion of each electrode and the head portion of an adjacent electrode;

nonconductive material filling the separation space between the head portions of the electrodes for insulating each electrode from the adjacent electrode;

a channel in the head portion of each electrode through which ink drops may pass and be charged.

4,194,212

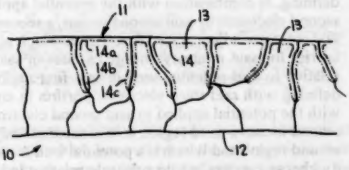
SEMICRYSTALLINE SILICON ARTICLE AND METHOD OF MAKING SAME

Joseph Lindmayer, Bethesda, Md., assignor to Solarex Corporation, Rockville, Md.

Continuation-in-part of Ser. No. 751,342, Dec. 16, 1976, abandoned, and Ser. No. 751,343, Dec. 16, 1976. This application Jun. 19, 1976, Ser. No. 916,545

Int. Cl.² H01L *27/14*

U.S. Cl. 357—30 **8 Claims**



1. A photovoltaic energy cell comprising a silicon wafer having a major surface adapted for the impingement of light thereon and another surface opposed to said impingement surface, said cell and said impingement surface being formed from randomly arranged, irregular, individual grains of silicon

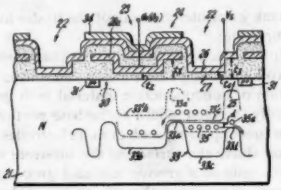
having portions thereof at said surface, said grains having mean diameters of at least about 100 microns and grain boundaries that at said impingement surface are in contact with or separated only slightly from the boundaries of adjoining grains, and a photovoltaic junction formed at said impingement surface and extending across and below said surface and also into the interior of said wafer along and inwardly of said grain boundaries, said junction penetrating said wafer to a substantial depth whereby the total junction area exceeds the product of the linear dimensions of said wafer surface but not to an extent whereby said junction extends completely around the boundaries of said silicon grains or from said impingement surface to said opposed surface of said wafer.

4,194,213

SEMICONDUCTOR IMAGE SENSOR HAVING CCD SHIFT REGISTER

Yasuo Kano, Tokyo; Shunsuke Furukawa, Ebina, and Tadayoshi Mifune, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 645,029, Dec. 29, 1975, abandoned. This application Aug. 18, 1977, Ser. No. 825,706
Claims priority, application Japan, Dec. 25, 1974, 49-3860
Int. Cl.[2] H01L *29/78, 27/14, 31/00*; G11C *19/28*
U.S. Cl. 357—24 **5 Claims**



1. A charge-coupled photo-sensor element for a semiconductor image sensor, said photo-sensor element comprising:

a substrate of one conductivity type;

an insulating layer on said substrate;

a first electrode on said insulating layer having first means for applying a potential to said first electrode, said first electrode having a first electrode portion which is spaced from said substrate by a thickness of said insulating layer for defining, in combination with the potential applied to said first electrode by said first means, a first region in said substrate which is a potential well for minority charge carriers in said substrate;

a second electrode in said insulating layer having second means for applying a potential to said second electrode, said second electrode having a second electrode portion adjacent one side of said first electrode and an adjacent third electrode portion remote from said first electrode, said second electrode portion being spaced from said substrate by a thickness of said insulating layer which is greater than the thickness of said insulating layer which spaces said third electrode portion from said substrate for defining, in combination with the potential applied to said second electrode by said second means, a second region in said substrate adjacent said first region which is a potential barrier for said minority charge carriers in said substrate relative to said potential well in said first region, and for defining with said third electrode portion in combination with the potential applied to said second electrode by said second means a third region in said substrate adjacent said second region and which is a potential well for said minority charge carriers in said substrate relative to said potential barrier in said second region; and

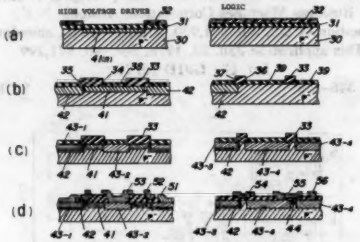
a third electrode in said insulating layer and extending generally parallel to said second electrode and electrically insulated from the latter by said insulating layer, said third electrode being connected with said second means for receiving a potential therefrom, said third electrode having a fourth electrode portion overlapping said third electrode portion and being spaced from said substrate by a thickness of said insulating layer which is larger than said thickness of the insulating layer which spaces said third electrode portion from said substrate, at least one of said second and third electrodes having a cutout portion cooperating with an adjacent portion of the other of said second and third electrodes to define an opening above said first region.

4,194,214

INTEGRATION OF HIGH VOLTAGE DRIVER AND LOW VOLTAGE LOGIC IN A SEMICONDUCTOR DEVICE

Katunobu Awane, Ikoma; Hironori Hattori, Suita; Tetuo Biwa, Osaka, and Hiroshi Tamaki, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 25, 1977, Ser. No. 827,677
Claims priority, application Japan, Aug. 26, 1976, 51-102296
The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.
Int. Cl.[2] H01L *27/04, 29/78*
U.S. Cl. 357—41 **3 Claims**



1. An integrated semiconductor device for electronically driving a matrix display panel comprising:

a semiconductor body means;

a plurality of high voltage diffusion-self-alignment metal oxide field effect semiconductors integrally formed on said semiconductor body for applying driving voltages to said dislay panel, each of said high voltage semiconductors including,

a drain region having a conductivity opposite that of the semiconductor body,

a source region having a conductivity opposite that of the semiconductor body,

a channel region of the same conductivity type as but more heavily doped than the semiconductor body, said channel region being formed to surround the source region,

a drift channel region of the opposite conductivity type to that of the semiconductor body, said drift channel region being formed on the surface of the semiconductor body to extend between the drain and the channel regions, a drain electrode connected to the drain region,

a source electrode connected to the source region,

a gate electrode formed above the channel region via a thin insulating layer, and

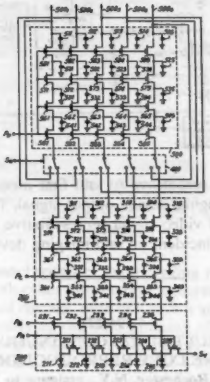
field plate means including a portion of said drain electrode extending toward said gate electrode to cover at least a portion of said drift channel region via a thick insulating layer; and

a plurality of low voltage metal oxide field effect semiconductors integrally formed on said semiconductor body for selectively enabling said high voltage semiconductors.

4,194,215
METHOD AND APPARATUS FOR DISPLAYING A VIDEO PICTURE ON A MATRIX OF LIGHT EMITTING ELEMENTS

Toshio Shionoya, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 16, 1978, Ser. No. 917,018
Claims priority, application Japan, Jun. 16, 1977, 52-71545
Int. Cl.[2] H04N 5/66, 3/12
U.S. Cl. 358—56 25 Claims



1. A method of displaying a video picture on a matrix array of light emitting elements formed of m rows and n columns of said elements, comprising the steps of:

receiving a video signal comprised of periodic vertical intervals each containing successive line intervals of video information;

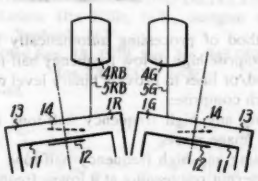
sampling said line intervals of video information and storing n sampled picture elements for each sampled line interval in a vertical interval; and

energizing, during a vertical interval, a light emitting element corresponding to a sampled picture element in a respective line interval for a duration greater than a line interval and less than a vertical interval as a function of the brightness of said sampled picture element when said sampled picture element is between black and peak white levels.

4,194,216
VIDEO PROJECTING APPARATUS

Masayuki Ohmori, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 25, 1978, Ser. No. 936,729
Claims priority, application Japan, Sep. 25, 1977, 52/101870
Int. Cl.[2] H04N 9/31
U.S. Cl. 358—60 5 Claims

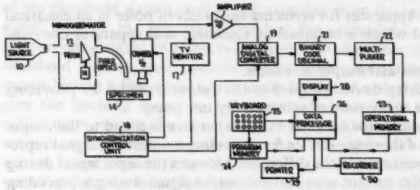


1. In an apparatus for projecting a compound video image onto a screen, and which comprises a plurality of color image sources, each forming a respective primary color image which has a central axis normal to the plane of the color image formed by said respective color image source, and a plurality of focusing means for projecting said color images onto said screen to form said compound image, said focusing means having respective principal axes which are arranged substantially parallel to one another; the improvement comprising each of said central axes being epaxially displaced from said principal axes of the respective focusing means for causing the projected color images to coincide on said screen, and at least one of said central axes being inclined to said principal axis of the respective focusing means.

4,194,217
METHOD AND APPARATUS FOR IN-VIVO SPECTROSCOPIC ANALYSIS

Francois J. G. van den Bosch, 11 Hillcrest Rd., Cedar Grove, N.J. 07009

Filed Mar. 31, 1978, Ser. No. 892,320
Int. Cl.[2] H06N 7/18
U.S. Cl. 358—93 14 Claims



1. Apparatus for the spectroscopic analysis of a specimen, comprising:

first means for scanning the specimen with a narrow band of a monochromatic light over a range of wavelengths;

second means for scanning the light reflected from said specimen and generating a signal representative thereof;

means for selectively gating a portion of said signal;

means for converting the gated signal into a digital signal;

means for storing said digital signal;

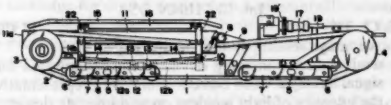
means for storing digital data representative of selected spectroscopic characteristics; and

means for reading out said digital data and said spectroscopic data to identify the spectroscopic characteristics of said specimen.

4,194,218
INSPECTION APPARATUS FOR UNDERGROUND CHANNELS

Kiyoshi Hasegawa, Tokyo, Japan, assignor to Kabushiki Kaisha Kantool, Tokyo, Japan

Filed Dec. 29, 1978, Ser. No. 388
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—100 5 Claims

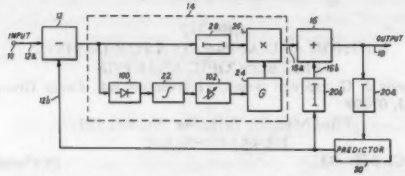


1. An inspection apparatus for underground channels comprising a chassis which has pulleys at the end portions thereof, endless V belts engaged with said pulleys, a reversible motor having a driving shaft, a television camera at one end portion of said chassis, means for adjusting the position of said television camera in accordance with the size of said channels, and cable means for remotely operating and controlling said television camera and said reversible motor.

4,194,219
NOISE REDUCTION IN ELECTRICAL SIGNALS

John O. Drewery, Coulsdon, England, assignor to British Broadcasting Corporation, London, England

Filed Mar. 6, 1978, Ser. No. 883,406
Claims priority, application United Kingdom, Mar. 7, 1977, 9537/77
Int. Cl.[2] H04N 5/21
U.S. Cl. 358—167 54 Claims



1. Apparatus for reducing the effect of noise in an electrical signal which is obtained by scanning, said apparatus comprising:

input and output terminals;

a delay device coupled to the output terminal for providing a delay time of substantially one scan;

a subtractor coupled to the input terminal and to the output of the delay device for providing a difference signal representative of the difference between the input signal during the current scan and the output signal during a preceding scan;

an attenuation circuit coupled to the output of the subtractor and arranged to attenuate low-amplitude portions of the difference signal relative to high-amplitude portions thereof; and

an adder having inputs coupled to the outputs of the attenuation circuit and of the delay device and having an output coupled to the output terminal;

the attenuation circuit comprising:

rectifying means and a variable gain element forming a series circuit coupled to the output of the subtractor;

a non-linear transfer characteristic element couled to the output of the series circuit, the non-linear element having a characteristic such that above a predetermined value a constant predetermined minimum attenuation factor applies; and

a multiplier one input of which is coupled to the subtractor output and the other input of which is coupled to the output of the non-linear transfer characteristic element the output of the multiplier forming the output of the attenuation circuit.

4,194,220
LEAKAGE CURRENT COMPENSATING CIRCUIT FOR SEMICONDUCTOR IMAGE SENSOR

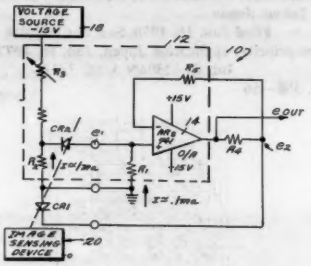
Wayne W. Frame, Longmont, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Mar. 27, 1978, Ser. No. 890,842
Int. Cl.[2] H04N 5/34
U.S. Cl. 358—221 17 Claims

1. An image sensing system comprising:

a semiconductor imaging device for generating an output signal having a video current component representative of the intensity of light incident on said imaging device, said imaging device output signal further including a leakage current component proportional to the temperature of said imaging device;

first means, including first and second forward biased p-n junctions maintained at a respective temperature in constant relationship with the temperature of said imaging device, for impressing the voltage developed across said second p-n junction across said first p-n junction and for generating from the forward current through said first p-n junction an output signal having a magnitude equal to the reverse saturation current of said forward biased p-n junction multiplied by a predetermined constant; and

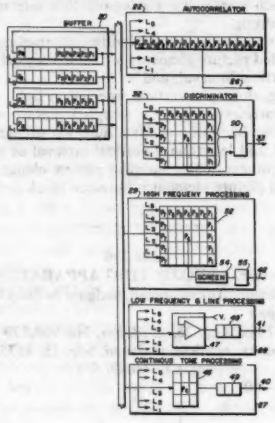


second means, responsive to said first means output signal and said imaging device output signal, for generating a compensated video signal representative of the intensity of said light incident on said imaging device.

4,194,221
AUTOMATIC MULTIMODE CONTINUOUS HALFTONE LINE COPY REPRODUCTION

James C. Stoffel, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1978, Ser. No. 973,821
Int. Cl.[2] H04N 1/40
U.S. Cl. 358—283 18 Claims



1. The method of processing automatically image pixels which may comprise high or low frequency half-tones, continuous tones, and/or lines to provide binary level output pixels, the steps which comprise:

(a) separating any high frequency half-tone image pixels from said image pixels;

(b) descreening any high frequency half-tone image pixels found to permit rescreening at a lower frequency;

(c) separating any continuous tone image pixels from said image pixels;

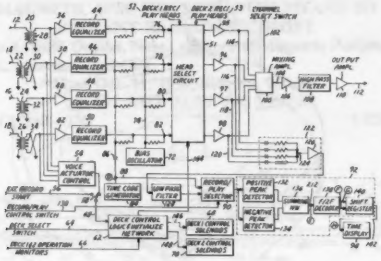
(d) screening any image pixels from steps b and c to produce binary level output pixels thereof; and

(e) thresholding the remaining low frequency half-tone and line image pixels to produce binary level output pixels.

4,194,222
MULTITRACK RECORDER INCLUDING SUPERIMPOSED REAL TIME CODE

Richard D. Ebbinga, Camarillo, Calif., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 23, 1978, Ser. No. 936,108
Int. Cl.[2] G11B 5/02
U.S. Cl. 360—18 **14 Claims**



1. A multichannel recorder for recording real time information together with other information, comprising

(a) a plurality of circuits, each of which is adapted for receiving and amplifying one of a plurality of analog data signals, including means for shifting received data signals in certain of said circuits out of phase with each other,

(b) means for generating a signal indicative of the real time at which said data signals are received, including

(i) means for generating a digital signal corresponding to said real time having two different width pulses representing digital "1"s and "0"s, respectively.

(ii) means for converting said first and second width pulses into an alternating signal containing two substantially sinusoidal frequency components, one frequency corresponding to said first width pulse and a second frequency corresponding to said second width pulses,

(c) means associated with each circuit for mixing a component of said alternating signal with said data signal therein, while maintaining each said alternating signal components within each circuit in phase with each other, and

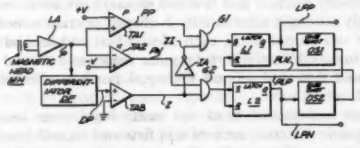
(d) means for recording each of said mixed data signals and alternating signals on a separate track of a multitrack recording medium,

wherein said time code information may be reconstructed by adding together signals recovered from tracks such that recovered data signals which are out-of-phase with each other at least partially negate each other, and recovered alternating signal components, all of which are in-phase, reinforce each other to provide a readily detectable signal having a level exceeding that attributable to said data signals.

4,194,223
MAGNETIC RECORDING DETECTION

Francis C. Marino, Dix Hills, N.Y., assignor to Redactron Corporation, Yaphank, N.Y.

Filed Sep. 18, 1978, Ser. No. 943,050
Int. Cl.[2] G11B 5/09
U.S. Cl. 360—41 **7 Claims**

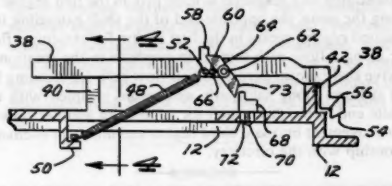


1. In a magnetic recording system wherein information is recorded according to one of the non-return-to-zero formats, apparatus for evaluating signals reproduced by a magnetic transducer comprising: a positive threshold detector means for giving a first threshold signal as long as a received signal is greater than a first given voltage level; a negative threshold detector means for giving a second threshold signal as long as a received signal is less than a second given voltage level; signal differentiator means for generating a derivative signal whose waveform is the time derivative of a received signal; means for connecting the magnetic transducer to each of said threshold detector means and said differentiator means; zero-crossing detector means for giving a zero-crossing signal whenever the amplitude of the derivative signal passes through a predetermined voltage level, the polarity of the zero-crossing signal being determined by the direction of the passage of the derivative signal through the predetermined voltage level; and bistable means connected to said zero-crossing detector means and said threshold detector means for giving a signal which switches from a first signal level to a second signal level at the coincidence of a zero-crossing signal of a first polarity and one of the threshold signals, and which switches from the second signal level to the first signal level at the coincidence of a zero-crossing signal of a second polarity and the other of the threshold signals, said bistable means comprising latching means having a first input which upon receipt of a signal triggers the latching means to a first state and a second input which upon receipt of a signal triggers the latching means to a second state, a first coincidence means having inputs connected to one of said threshold detector means and said zero-crossing detector means and an output connected to the first input of said latching means, and a second coincidence means having inputs connected to the other of said threshold detector means and said zero-crossing detector means and an output connected to the second input of said latching means.

4,194,224
DISK INDICATOR AND EJECTOR

Robert D. Grapes, Oklahoma City, and Donald J. Watson, Bethany, both of Okla., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Sep. 1, 1978, Ser. No. 939,007
Int. Cl.[2] G11B 17/02
U.S. Cl. 360—97 **6 Claims**



1. Disk drive apparatus having a housing adapted to receive a disk cartridge for digital insertion to a substantially centered position within the housing, said housing including a base, guide means mounted to the base for maintaining said cartridge substantially in a selected plane as it is so inserted, and a clamshell assembly including a clamshell mounted to the base for movement between an open position to receive said disk cartridge and a closed position to drivably engage the cartridge; wherein the improvement comprises:

a linking member supported with respect to the base for inward and outward movement generally in the direction of said digital insertion; biasing means for urging outward movement of the linking member; stop means for preventing movement of said linking member outward beyond a first position; linking means mounted to the linking member and positioned to contact the leading edge of said cartridge during said insertion and before the cartridge

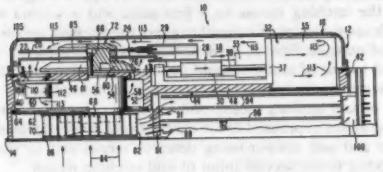
reaches said centered position, further cartridge insertion after such contact moving said linking member inwardly from said first position against the force of said biasing means; fastening means mounted to the linking member; and a locking pin mounted to the clamshell and, with said clamshell open, positioned so that it is engaged by said fastening means substantially as the cartridge reaches said centered position, thereby retaining the linking member at an initial linking position against the force of said biasing means, movement of said clamshell from the open position to the closed position after such engagement moving said locking pin inward thereby moving said linking member to a final linking position wherein said linking means is free of said cartridge.

4,194,225

HOUSING FOR DISK DRIVE UNIT

Alfred Hasler, Mountain View, Calif., assignor to International Memories, Inc., Cupertino, Calif.

Filed Jun. 6, 1978, Ser. No. 913,156
Int. Cl.[2] G11B *17/02*
U.S. Cl. 360—98 **16 Claims**



1. In a disk drive unit having a magnetic storage disk and electronic circuitry: a housing including a first region for receiving said magnetic storage disk, said housing having a second region adjacent to the first region and a third region adjacent to and communicating with the second region for containing said circuitry, first region being closed to the atmosphere and the second region being open to the atmosphere; a motor in the housing and provided with a drive shaft having a pair of ends projecting outwardly from the motor in opposite directions, one end of the drive shaft being in the first region for connection to a magnetic storage disk in the first region for rotating the same, the opposite end of the shaft extending into the second region; means in the first region for creating a flow of air along a flow path therein in response to the rotation of the drive shaft; means across said air flow path for cleaning the air as it flows along said path; and means coupled with the opposite end of the drive shaft for generating another flow of air for movement into said third region and into heat exchange relationship with the circuitry.

4,194,226

RIGID MAGNETIC DISC MEMORY APPARATUS INCLUDING OPEN LOOP STEPPER-MOTOR-DRIVEN READ/WRITE HEAD

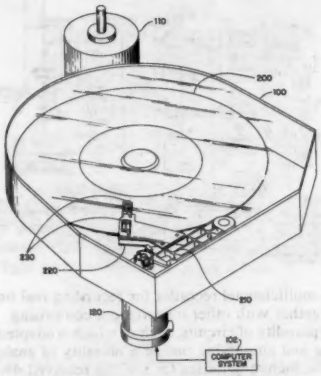
Robert Kaseta, Stow; Lenn Daugherty, Northboro, and Sigmund Hinlein, Sudbury, all of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Apr. 24, 1978, Ser. No. 899,046
Int. Cl.[2] G11B *5/55, 5/48, 21/08, 21/22*
U.S. Cl. 360—106 **2 Claims**

1. In memory apparatus supported by a base and intended for use in a digital computer system, said apparatus comprising at least one spinable and rigid magnetic disk for recording digital information; magnetic head means for reading said information from and writing said information into said disk; positioning means for accurately positioning said magnetic head means parallel and adjacent to the plane of said disk; said positioning means comprising:

supporting means movably mounted on said base for supporting said magnetic head means;

stepper motor means including a rotational stepper motor rotatably mounted on said base, said rotational stepper motor having a rotational shaft and responsive to electrical signals from said computer system for providing mechanical step rotation of said shaft;



band means for coupling said step rotation of said shaft to said movably mounted supporting means, whereby said head means is stepped along said disk surface; and

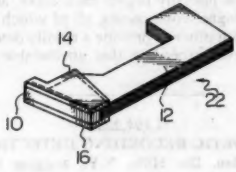
viscously-coupled inertia damping means mounted around said shaft for providing viscously-coupled inertia damping of the step-rotating motion of said shaft.

4,194,227

COMPOSITE MAGNETIC CORE ASSEMBLY HAVING AT LEAST ONE SIDE TIP FOR A MAGNETIC HEAD

Takashi Kitamura, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jul. 18, 1978, Ser. No. 925,866
Claims priority, application Japan, Jul. 19, 1977, 52-95967[U]; Feb. 8, 1978, 53-13141
Int. Cl.[2] G11B *5/22, 5/42*
U.S. Cl. 360—122 **9 Claims**



1. A composite magnetic core assembly for a magnetic head, comprising:

(a) first and second back cores having a high magnetic permeability, each of said first and second back cores respectively having a substantially L-shaped portion which has first and second ends, each of said first and second ends having a substantially rectangular shape, said second ends of said first and second L-shaped portions abutting on each other;

(b) first and second head tips made from wear resisting magnetic material, each of said first and second head tips having an oblique prism shape, one side of said first and second head tips being fixedly connected to said first ends of said first and second L-shaped portions respectively, a

portion of said first head tip facing a portion of said second head tip to form a transducing gap; and

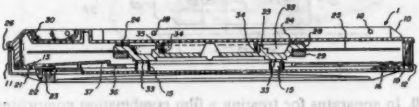
(c) at least first and second side plates, said first side plate being fixedly attached to one side of said first head tip and to one side of said first back core, said second side plate being fixedly attached to one side of said second head tip and to one side of said second back core.

4,194,228

MAGNETIC DISC HOUSING WITH MEANS TO PREVENT RADIAL DISC SHIFT

James A. Duff, Omaha, Nebr., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Oct. 11, 1978, Ser. No. 950,346
Int. Cl.[2] G11B *23/02*; B65D *85/30*
U.S. Cl. 360—133 **5 Claims**



1. In a disk memory module of the type having a permanent substantially circular housing enclosing the disk, said disk supported by a hub having a central drive unit spindle attachment area and a peripheral downwardly facing support area, said housing having an opening in the bottom allowing access to the spindle attachment area of the drive unit spindle and supporting around its edge the hub on its peripheral support area in a predetermined axial position, an improvement for preventing radial shifting of the hub past a predetermined deviation from concentricity with the housing, comprising

(a) an annular projection of predetermined height fixed to and extending downwardly from the interior surface of the top of the housing and substantially concentrically located thereon; and

(b) an area on the hub portion facing the annular projection having an annular depression into which the annular projection extends a predetermined distance with predetermined axial and radial tolerances therebetween while the hub's peripheral support area is supported by the edge of the housing bottom opening, said predetermined radial tolerance equaling the predetermined deviation from concentricity.

4,194,229

MODE SELECTING ASSEMBLY FOR RECORDING AND/OR REPRODUCING APPARATUS

Yoshinori Yamamoto, Tokyo; Hideo Imai, and Yoshikazu Ishimatsu, both of Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 11, 1978, Ser. No. 941,090
Claims priority, application Japan, Sep. 12, 1977, 52-109745
Int. Cl.[2] G11B *19/00*
U.S. Cl. 360—137 **18 Claims**

1. A mode selecting assembly for a recording and/or reproducing apparatus wherein signals are recorded on a recording media and/or reproduced from a recording media comprising:

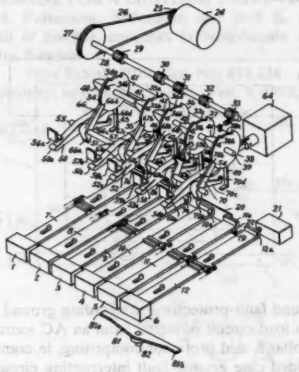
at least one mode selecting push-button associated with a selected operating mode for said apparatus, said push-button being depressible from a first inactive position to a second active position to initiate selection of an operating mode for said apparatus;

an operating member associated with each said push-button for effecting a change over from one mode for said apparatus to another mode responsive to the displacement of said operating member from a first inactive position to a second active position initiated by the depression of said at least one push-button;

an operating gear member associated with each said operating member, said operating gear member including a toothless portion along a limited circumferential extent of said gear member, said gear member being operatively interconnected with said associate operating member to effect displacement of the latter from its first position to its second position upon rotation of said operating gear member;

pinion associated with each said operating gear member disposed to engage said operating gear member to drive the latter when said associated pinion is in engagement with the toothed portion of said operating gear member and wherein said pinion is disengaged from said operating gear member when said toothless portion of the latter moves into registry with said pinion;

trigger means operatively associated with each said mode



selecting push-button and movable from a first inactive position to a second active position to initiate engagement of said toothed portion of the operating gear member with said pinion in response to the depression of said push-button whereby said operating gear member is driven by said pinion through the toothed portion of each rotary cycle of said operating gear member to thus establish a selected operating mode for said apparatus; and

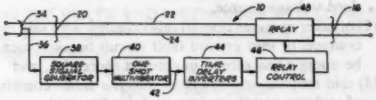
stop means associated with each said operating gear member for preventing further rotation of said operating gear member after the latter has completed said cycle and said selected operating mode has been established, whereby said operating gear member is prevented from rotating beyond one rotary cycle and reengaging said pinion if said associated push button is held down in said second position.

4,194,230

HAZARDOUS VOLTAGE PROTECTION CIRCUITRY

Glenn S. Danford, Oklahoma City, Okla., assignor to Southwest Utilities, Inc., Oklahoma City, Okla.

Filed Sep. 11, 1978, Ser. No. 941,068
Int. Cl.[2] H02H *3/04, 7/26*
U.S. Cl. 361—1 **14 Claims**



1. A hazardous voltage isolation and protection device for interconnection between a telephone installation line output and the external telephone distribution line, comprising:

discrimination means connected to said line output and

providing a control signal output upon detection of approximately sixty cycle per second voltage on said line output;

switching means connected in series with said external telephone distribution line; and

reactance means responsive to input of said control signal to actuate said switching means and disconnect said external telephone distribution line.

4,194,231

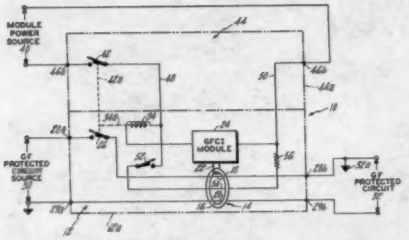
DUAL VOLTAGE GROUND FAULT PROTECTOR

Keith W. Klein, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Mar. 8, 1978, Ser. No. 884,501

Int. Cl.[2] H02H *3/28*

U.S. Cl. 361—45 **2 Claims**



1. A ground fault protector for affording ground fault protection to a load circuit powered from an AC source of non-standard voltage, said protector comprising, in combination:

A. a molded case ground fault interrupting circuit breaker including

(1) breaker contacts,

(2) a differential current transformer having first, second and third primary windings and a secondary winding,

(3) an electronic ground fault module connected with said secondary winding for processing a ground fault signal induced therein pursuant to initiating a ground fault trip function,

(4) a trip solenoid activated under the control of said module to precipitate opening of said breaker contacts, thereby effectuating said ground fault trip function;

(5) line and neutral terminals for respective connection to the line and neutral sides of the non-standard voltage source, load power and load neutral terminals for respective connection to the line and neutral sides of the ground fault protected load circuit, said line and load power terminals connected in series through said breaker contacts and said first primary winding, and said neutral and load neutral terminals connected in series through said second secondary winding, and

(6) a normally open test switch and a calibrated resistor electrically connected in series with said third primary winding; and

(B) a conventional molded case circuit breaker ganged in side-by-side relation with said ground fault circuit breaker and including

(1) line and load terminals for connection across a standard voltage source,

(2) breaker contacts operatively coupled with said breaker contacts of said ground fault circuit breaker such as to be opened and closed in concert therewith, and

(3) said module, trip solenoid, and the series combination of said test switch, resistor and third secondary winding connected between said line and load terminals of said conventional circuit breaker to draw current from the standard voltage source through said breaker contacts of said conventional circuit breaker.

4,194,232

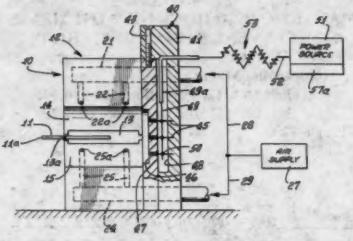
ION TREATMENT OF PHOTOGRAPHIC FILM

James M. Cumming, 4571 Comber Ave., Encino, Calif. 91316, and Donald G. Saurenman, 6787 Worsham Dr., Whittier, Calif. 90602

Filed Mar. 31, 1978, Ser. No. 892,139

Int. Cl.[2] H05F *3/04*; H01T *19/04*

U.S. Cl. 361—213 **28 Claims**



10. In apparatus for treating a film combination comprising

(a) a support,

(b) means associated with the support defining a film treatment zone in the shape of a recess having a front opening and opposite side openings which are laterally spaced apart, and through which film may be laterally passed,

(c) means for supplying streams of gas to said zone and closely adjacent opposite faces of the film passing laterally through said treatment zone, and

(d) means for effecting delivery of ions to come in contact with said opposite faces of the film passed through said zone, said means including tips to which voltage is supplied,

(e) said treatment zone being generally venturi shaped between said opposite side openings, said means for supplying streams of gas including ducting having discharge ports facing a throat portion of said zone.

4,194,233

MASK APPARATUS FOR FINE-LINE LITHOGRAPHY

Addison B. Jones, La Mirada, and David B. Wittry, Pasadena, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 30, 1978, Ser. No. 873,307

Int. Cl.[2] H02N *13/00*

U.S. Cl. 361—233 **13 Claims**

1. Apparatus for supporting a substrate means to be operated upon, comprising

chuck means for holding said substrate means,

mask means disposed adjacent to said substrate means,

first means for confining a first layer of thermally conductive conformable material between said mask means and said substrate means,

second means for confining a second layer of thermally conductive, conformable material between said substrate and said chuck means, and

charging means for establishing an electrical charge on said mask to produce a force field between said mask means and said substrate means,

said first and second layers providing accurate positioning and thermal stabilization of said mask means.

4,194,234

SIMULTANEOUS MULTI DIRECTIONAL SINGLE SOURCE MULTIPLE REFLECTOR ELECTRONIC PHOTO FLASH UNIT

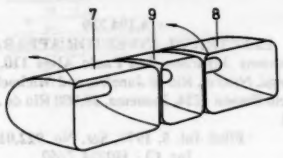
Udo M. Geissler, Munich, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft für Elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany

Filed Sep. 6, 1978, Ser. No. 940,011

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1977, 2740487

Int. Cl.[2] **G03B** *15/02*

U.S. Cl. 362—17 **10 Claims**



1. Single-source multiple reflector electronic photo flash unit having

a holder (1);

a single gas discharge lamp (2) positioned in said holder;

and reflector means (4) positioned in the light path from the gas discharge lamp to reflect light therefrom

wherein, in accordance with the invention

the reflector means comprises

a plurality of individual reflector elements (4',4''; 7, 8, 9; 6, 10, 11, 12; 13, 14) located adjacent each other of which at least one is relatively movable with respect to the light source and with respect to another relector element to permit directing light from the single gas discharge lamp in multiple directions upon flash-illumination thereof.

4,194,235

AUTOMATIC HEADLIGHT TILTING DEVICE FOR AUTOMOBILES

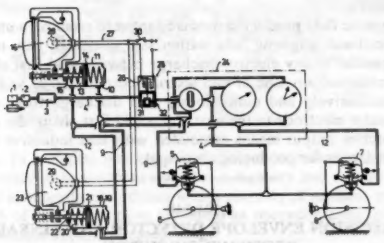
Werner Heinlein, Wiernsheim-Pinache, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 28, 1978, Ser. No. 881,988

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1977, 2706770

Int. Cl.[2] **B60Q** *1/12*

U.S. Cl. 362—38 **3 Claims**



1. In an apparatus for automatically adjusting the beam angle of motor vehicle headlights, which includes a headlight switch for energizing the headlights from the vehicle electrical system and modulators linked to the vehicle axles and responsive to the chassis-to-axle distance for supplying fluid of varying pressure to servo-mechanisms connected to tilt the headlights, the improvement comprising a normally closed electromagnetic valve disposed in a conduit between a source of pressurized fluid and said modulators and connected in parallel with said headlight switch, so that said valve is opened to activate said beam angle adjusting apparatus only when said headlight switch is closed.

4,194,236

ARRANGEMENT FOR A LIGHTING UNIT IN VEHICLES

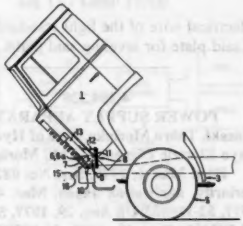
Axel J. M. Pettersson, Södertälje, and Rolf K. Johansson, Trosa, all of Sweden, assignors to Saab-Scania Aktiebolag, Södertälje, Sweden

Filed Feb. 1, 1978, Ser. No. 874,224

Claims priority, application Sweden, Feb. 3, 1977, 7701202

Int. Cl.[2] **B60Q** *1/04*

U.S. Cl. 362—66 **8 Claims**



1. An arrangement for a front lighting unit in a wheeled vehicle comprising a vehicle chassis frame and a vehicle body portion which is pivotably mounted relative to the vehicle chassis frame for swinging movement about a transverse axis at the front end of the vehicle chassis frame, said vehicle body portion having a forward front section with a recess in which the lighting unit is adapted to fit, said lighting unit being supported at a transverse horizontal axis substantially coinciding with the axis constituting the fulcrum for the pivoting movements of the vehicle body portion, and said lighting unit having an optical axis and being arranged to assume an attitude such that the optical axis of said lighting unit has a definite angular attitude relative to the vehicle chassis frame when the vehicle body portion is in its normal position.

4,194,237

LEVELING PLATE AND METHOD OF UTILIZING SAME

Albert H. Conklin, 377 Woonasquatucket Ave., North Providence, R.I. 02911

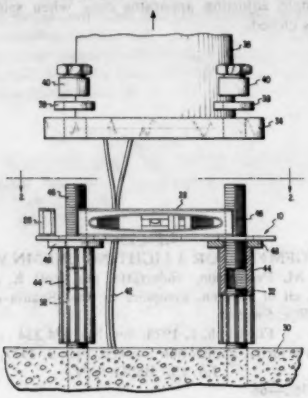
Filed Jul. 24, 1978, Ser. No. 927,493

Int. Cl.[2] **F21V** *33/00*

U.S. Cl. 362—253 **4 Claims**

1. A new article of manufacture comprising a leveling plate particularly adapted for leveling added supports for a light standard while the light standard remains electrically coupled, said leveling plate having holes therethrough in accordance

with the pattern of retaining bolts for the light standard, a notch through one edge of said plate for the reception of an



attached electrical wire of the light standard, and level means carried by said plate for leveling said plate.

4,194,238

POWER SUPPLY APPARATUS

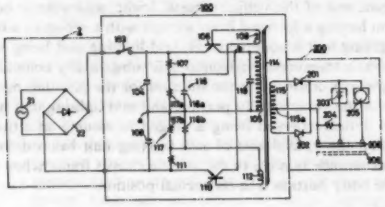
Takaaki Masaki, Tohru Morioka, both of Hyogo, Japan, assignor to Sanyo Electric Company, Ltd., Moriguchi, Japan

Filed Mar. 1, 1978, Ser. No. 882,413

Claims priority, application Japan, Mar. 4, 1977, 52-25301; Aug. 25, 1977, 52-114853[U]; Aug. 29, 1977, 52-116295[U]; Sep. 7, 1977, 52-108438; Nov. 18, 1977, 52-139596; Nov. 18, 1977, 52-156250[U]; Dec. 14, 1977, 52-152151; Dec. 14, 1977, 52-152152; Dec. 14, 1977, 52-152153[U]

Int. Cl.[2] H02M *3/335*

U.S. Cl. 363—17 **19 Claims**



1. A power supply apparatus comprising a direct current voltage source, and an inverter for converting a direct current output from said direct current voltage source into an alternate current voltage, said inverter comprising:

a first series connection of a pair of first and second dividing capacitors, said first series connection being coupled in parallel with said direct current voltage source,

a second series connection of a pair of first and second transistors, each including emitter, base and collector electrodes, said series connection being coupled in parallel with said direct current voltage source,

a pair of first and second base resistors,

a saturable transformer including a saturable magnetic core, a primary winding wound on said saturable magnetic core, and a pair of first and second feedback windings wound on said saturable magnetic core and magnetically coupled to said primary winding,

said primary winding being connected between the junction of said pair of first and second dividing capacitors of said first series connection and the junction of said pair of first and second transistors of said second series connection,

each of said pair of first and second feedback windings being coupled between said base and emitter electrodes of each of said pair of first and second transistors through each of said pair of first and second base resistors, respectively, and

impedance means connected between the junction of said first feedback winding and said first base resistor of said first transistor and the junction between said second feedback winding and said second base resistor of said second transistor.

4,194,239

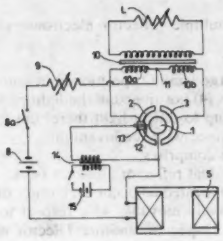
ELECTRICAL INVERTOR APPARATUS

Krishnaswamy Jayaram, Rua Paulo Alves 110, Block A, Apt. 604, Inga, Niteroi, Rio de Janeiro, and Michael F. Reusch, Av. Epitacio Pessoa 1274, Ipanema, 20.000 Rio de Janeiro, both of Brazil

Filed Jul. 5, 1978, Ser. No. 922,014

Int. Cl.[2] H02M *7/60*

U.S. Cl. 363—109 **25 Claims**



1. Electrical apparatus comprising in combination:

a first central electrode;

an even number of generally annular sector electrodes disposed coaxially around said first electrode and separated therefrom by a substantially constant continuous discharge gap said sector electrodes being spaced from each other by a gap substantially smaller than said discharge gap;

said first electrode having a first terminal for connection to one side of a D.C. power supply;

a second terminal for connection to the other side of said D.C. power supply and connected in parallel to each of said sector electrodes through respective inductive impedances;

magnetic field producing means adapted to establish a unidirectional magnetic field within said discharge gap, nonparallel to any electric discharge between said first electrode and any one of said sector electrodes so as to shift successively and continuously said discharge from one sector electrode to the next about said first electrode; and

inductive output means associated with said inductive impedances for producing an output.

4,194,240

PRECISION ENVELOPE DETECTOR AND LINEAR RECTIFIER CIRCUITRY

Thomas J. Davis, Richland, Wash., assignor to United States of America, Washington, D.C.

Filed May 2, 1978, Ser. No. 902,250

Int. Cl.[2] H02M *7/06*; G01R *19/04*

U.S. Cl. 363—126 **6 Claims**

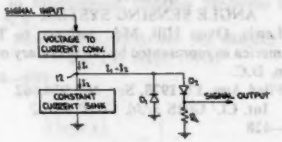
1. A linear rectifier for the rectification of an input low voltage, high frequency signal comprising:

voltage-to-current converter means, having an input, said input connected to said signal, for transforming said input

low voltage signal into variations in output current flow, said variations linearly related to said low voltage, high frequency signal, said converter means providing a constant output in the absence of an input signal;

sink means connected to the output of said converter means, for absorbing a preset constant amount of current from said converter means;

first diode means, having two ends and a polarity, one end of which is connected to a junction between said converter



means and said sink means, and the other end of which is grounded; and

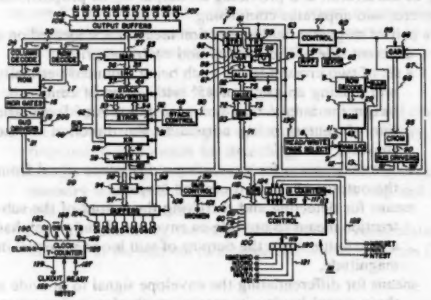
second diode means having a polarity, said second diode means connected in series with a resistance means for providing a voltage drop across said resistance means when current flows therethrough, said second diode means and said resistance means together having two ends, one of which is connected to said junction and the other of which is grounded, said second diode connected to have a polarity opposite the polarity of said first diode.

4,194,241

BIT MANIPULATION CIRCUITRY IN A MICROPROCESSOR

George E. Mager, Manhattan Beach, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 8, 1977, Ser. No. 814,051
Int. Cl.² G06F 7/00, 9/08
U.S. Cl. 364—200 **5 Claims**



1. In a digital processor including means for executing a plurality of instructions stored in a memory and carried from said memory in accordance with a plurality of machine cycles, each of said instructions including an operation code, bit manipulation apparatus comprising:

first means for generating a particular bit-mask in response to a particular operational code for an instruction being executed;

second means for storing said particular bit-mask,

third means for storing a word in which a bit is to be manipulated;

logic means for performing a particular logic operation on the output of said second means and the output of said third means;

said first means is responsive to the three least significant bits of said particular operational code; and

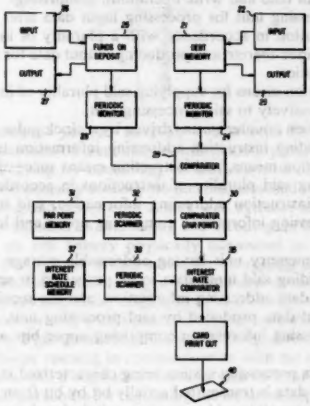
the first means generates a bit-mask in binary digits which is the complement of 2^i which is the number in base 10 represented by the three least significant bits of said particular operational code.

4,194,242

METHOD AND SYSTEM FOR DETERMINING INTEREST RATES

Robert Robbins, Atlanta, Ga., assignor to Patricia Ann Cotts; Nancy Fern Hamburger, both of Atlanta; Betty B. Robbins and William Norman Robbins, both of Decatur, all of, Ga.

Filed Sep. 22, 1976, Ser. No. 725,535
Int. Cl.² G06F 13/00
U.S. Cl. 364—200 **10 Claims**



1. A method for providing data regarding interest rates comprising the steps of:

storing the value of a borrower's funds on deposit in a computer memory;

storing the amount of a borrower's indebtedness in the computer memory;

monitoring the computer memory periodically by a scanning means connected to the computer memory to determine the extent of the borrower's indebtedness and the value of the borrower's funds on deposit at a given time, the scanning means providing at its output a signal corresponding to the borrower's indebtedness and funds on deposit;

comparing the borrower's funds on deposit to the borrower's indebtedness by a division circuit means which is connected to the scanning means to determine the ratio of output of the scanning means to form a Compensating Balance; and

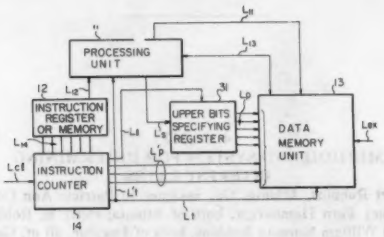
increasing the interest rate provided by a printout connected to the division circuit means, if the Compensating Balance is less than par point and decreasing the interest rate provided by the printout if the Compensating Balance is greater than par point.

4,194,243

DATA PROCESSING SYSTEM HAVING PORTIONS OF DATA ADDRESSING AND INSTRUCTION ADDRESSING INFORMATION PROVIDED BY A COMMON SOURCE

Toshitaka Tsuda, Kawasaki, Japan, assignor to Fujitsu Limited, Japan

Filed Apr. 14, 1977, Ser. No. 787,494
Claims priority, application Japan, Apr. 30, 1976, 51-49494
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **21 Claims**



1. In a data processing system for processing data in accordance with read and write operations, comprising:

a processing unit for processing input data after said read operation in accordance with a plurality of instructions provided thereto and producing output data for said write operation:

instruction means for supplying said plurality of instructions successively to said processing unit;

instruction counter means driven by a clock pulse signal for providing instruction addressing information to said instruction means, said instruction means successively producing said plurality of instructions in accordance with said instruction addressing information, said instruction addressing information comprising upper and lower bits; and

a data memory unit having addressable storage areas for providing said input data to be processed in accordance with data addressing information, and for receiving said output data produced by said processing unit, said data addressing information comprising upper bits and lower bits;

said data processing system being characterized in that said input data is transmitted serially bit by bit from said data memory unit to said processing unit during the read operation, and said output data is transmitted serially bit by bit from said processing unit to said data memory unit during the write operation;

the improvement wherein said instruction counter means comprises an upper bits region for holding said upper bits of said instruction addressing information, and a lower bits region for holding said lower bits of both said instruction addressing information and said data addressing information;

said instruction counter means including means for synchronously providing the contents of said lower bits region of said instruction counter means in synchronization both to said instruction means as said lower bits of said instruction addressing information and to said data memory unit as said lower bits of said data addressing information, whereby said lower bits of said instruction addressing information and said data addressing information, respectively, are provided by a common source;

said instruction counter means also including first means for providing the contents of said upper bits region of said instruction counter means to said instruction means as said upper bits of said instruction addressing information;

said system further comprising generating means for continuously generating random bits partially defining successive addressable storage areas in said data memory unit to be addressed, and second means connected to said generating means for providing said random bits to said data memory unit as said upper bits of said data addressing information,

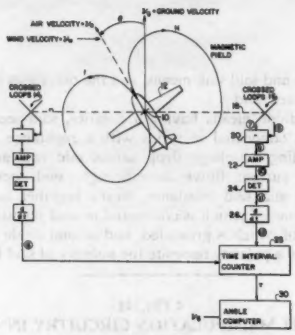
whereby said processing unit is instruction-addressed and said data memory unit is data-addressed in synchronization, one with the other, with resultant improved efficiency.

4,194,244

ANGLE SENSING SYSTEM

Bernard L. Lewis, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 17, 1978, Ser. No. 934,662
Int. Cl.[2] G01S *3/36*; G01P *13/02*
U.S. Cl. 364—428 **7 Claims**



7. Apparatus for determining the crab angle, θ of an aircraft which is coming in along a runway for a landing thereon and which is carrying a loop antenna which is radiating an electromagnetic audio-frequency sine wave, said apparatus being used in conjunction with means for determining the ground speed, v_g, of the aircraft and providing an output signal proportional thereto, said apparatus comprising:

a pair of magnetic-field interaction means, each located on a different side of the runway and each comprising:

a set of two crossed loops, each being mounted vertically and making an angle of 45° with a line of centers between the intersection points of the sets of loops, the line of centers being normal to the direction of the runway,

subtracting means for generating a difference signal from the outputs of the two crossed loops,

means for detecting and rectifying the output of the subtraction means to provide an envelope signal which has a zero value when the outputs of said loops are equal in magnitude,

means for differentiating the envelope signal to provide a sharp signal having its maximum absolute value when the envelope signal has its zero value, the time interval, T, between the sharp output of each differentiating means being a function of the crab angle, θ, of the aircraft;

time-interval-determining means, to which the outputs of said differentiating means are fed, for measuring the time interval, T, and providing an output signal in proportion thereto; and

angle-computing means, to which the time interval signal, T, and the ground speed signal, v_g, are fed, for computing the crab angle, θ, in accordance with the equation

$$\theta=(3/2D)v_gT$$

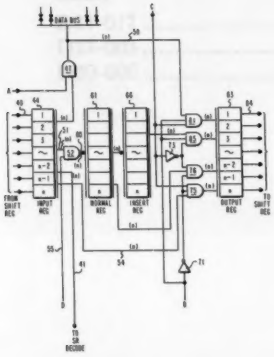
where D is the distance between the intersection points of the two sets of loops along the line of centers.

4,194,245

SYSTEM FOR RANDOMLY ACCESSING A RECIRCULATING MEMORY

Robert A. Pascoe, Round Rock; Charles N. Sprott, Austin, both of Tex., and Douglas W. Westcott, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,442
Int. Cl.[2] G11C *19/00*
U.S. Cl. 364—900 **4 Claims**



1. A memory control system for randomly relocating the accessible operating flag in a recirculating memory in one revolution of the memory comprising:

code means in said recirculating memory for defining the accessible operating flag in said memory;

means for receiving an address to be accessed in said memory;

means for decoding said address into a count representing the number of memory locations the code means is to be moved from its present location to the address to be accessed;

means for detecting said code means;

means for generating a control signal for removing said code means from recirculating in said recirculating memory in response to said means for detecting;

means for counting the number of codes recirculating in said memory while said code means is removed in response to said means for decoding; and

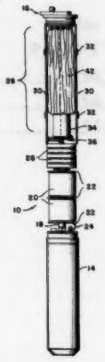
means for reinserting the code means in said recirculating memory at the address to be accessed when the means for counting has counted a number of codes equal to the count established by said means for decoding.

4,194,246

NOISEMAKER BEACON

Ralph P. Crist, Harrisburg, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 12, 1958, Ser. No. 734,803
Int. Cl.[2] H04B *11/00*
U.S. Cl. 367—1 **6 Claims**



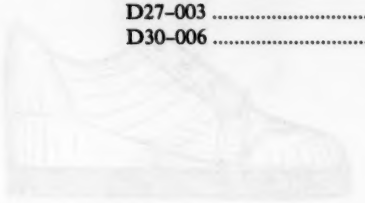
1. An acoustic jammer assembly constructed for ejection from a signal tube on a submarine, said assembly comprising a cylindrical casing for containing various elements of the jammer; a high frequency acoustic noisemaker attached to one end of said casing and comprising a thick wall cylinder having the same outer diameter as said casing and incuding an energizing motor; a sea cell battery physically connected to said and electrically connected to said motor for energizing said motor and mounted inside said casing; a flotation unit mounted inside said casing and physically connected to said battery; said flotation unit comprising a collapsed parachute, an inflatable balloon having a gas generating balloon inflating canister having a gas discharge opening in communication with the interior of said balloon, and a regulating valve in said balloon and actuated by said parachute for regulating the flotation depth of said flotation unit; a conical spring ejector compressed between said flotation unit and said battery for ejecting said flotation unit from said casing; a removable end cover plate for the casing, said cover plate including a trigger actuated mechanism so constructed as to be operated upon passage of the assembly through said signal tube thereby releasing the cover plate from the casing, whereby said compressed ejector spring may eject said flotation unit and allow water to come in contact with the gas generator and battery.

DESIGN PATENTS

GRANTED MAR. 18, 1980

ERRATA

For CLASS	See PATENT NO.
D24–017	254,504
D27–003	254,510
D30–006	254,511



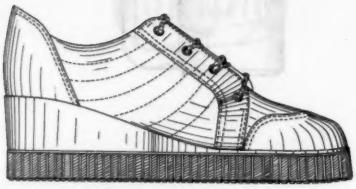
DESIGN PATENTS

GRANTED MAR. 16, 1976

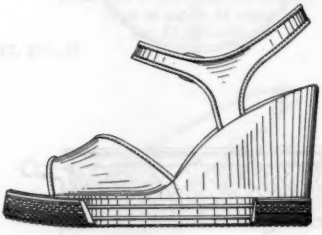
CORRECTED

Class	Design Patent No.
D34-017	234,309
D27-003	234,310
D10-008	234,311

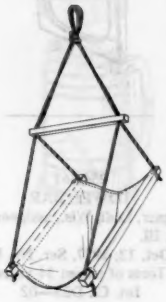
254,456
WEDGIE
Norman H. Finn, Waban, Mass., assignor to The United States Shoe Corporation, Cincinnati, Ohio
Filed Feb. 7, 1978, Ser. No. 875,879
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—286



254,457
OPEN TOE WEDGIE SNEAKER WITH TOE AND HEAL GUARDS
Norman H. Finn, Waban, Mass., assignor to The United States Shoe Corporation, Cincinnati, Ohio
Filed Nov. 23, 1977, Ser. No. 854,369
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—296



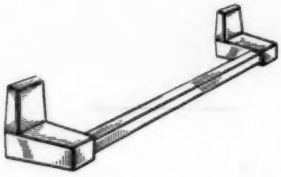
254,458
HAMMOCK-TYPE HANGING CHAIR
Anne E. Wakefield, 3553 Mission St., Apartment B, San Francisco, Calif. 94110
Filed Oct. 11, 1977, Ser. No. 841,145
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—53



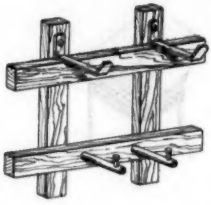
254,459
CHAIR
Jerome Eastman, 3 E. Ontario St., Chicago, Ill. 60611
Filed Aug. 15, 1977, Ser. No. 824,969
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—70

254,460
TOWEL RING
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Filed Oct. 12, 1977, Ser. No. 841,540
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—99

254,461
TOWEL BAR
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Filed Oct. 12, 1977, Ser. No. 841,544
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—99

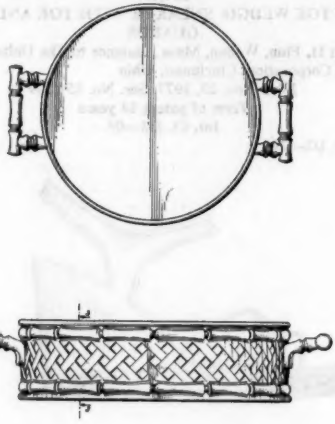


254,462
COMBINED HAIR DRYER AND CURLING IRON CADDY
Donald W. Heckathorn, 31556 Agoura Rd., Westlake Village, Calif. 91361
Filed May 19, 1978, Ser. No. 907,895
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—114

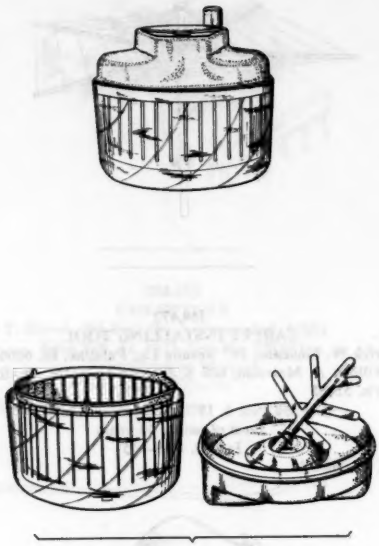


254,463
BEVERAGE CONTAINER
Michael C. Wilson, Glen Ellyn, Ill., assignor to Howw Manufacturing Company, Carol Stream, Ill.
Filed Dec. 14, 1977, Ser. No. 861,026
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—9

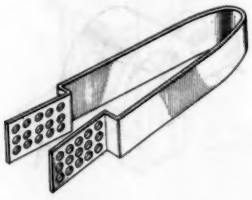
254,464
GALLERY TRAY
Stuart A. Young, Meriden, Conn., assignor to International Silver Company, Meriden, Conn.
Filed Jul. 5, 1977, Ser. No. 813,218
The portion of the term of this patent subsequent to Dec. 25, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—20



254,465
COMBINED SALAD DRYER AND TOSSER
Bernard Pauty, Fontaine les Dijon, France, assignor to SEB, Selongey, France
Filed May 3, 1977, Ser. No. 793,436
Claims priority, application France, Nov. 10, 1976, 76 135
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—47

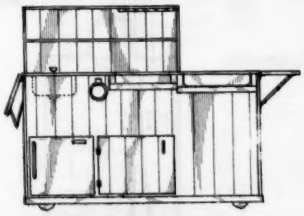


254,466
TEA BAG SQUEEZER
Louis A. Carson, 1432 Erin Ave., Upland, Calif. 91786
Filed Feb. 9, 1978, Ser. No. 876,548
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—47



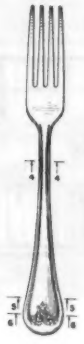
254,467
CONDIMENT SHAKER OR SIMILAR ARTICLE
James L. Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 610,095, Sep. 4, 1975, Pat. No. Des. 246,882. This application Jun. 16, 1977, Ser. No. 807,308
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—56

254,468
PATIO BAR AND BAR-B-QUE UNIT
Averil B. Cox, 20239 Arminta, Canoga Park, Calif. 91306
Filed Sep. 27, 1977, Ser. No. 837,050
Term of patent 14 years
Int. Cl. D7—*02*; D12—*14*
U.S. Cl. D7—108



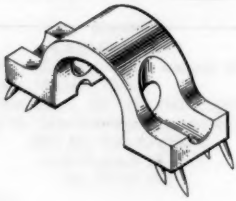
254,469
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Dec. 27, 1977, Ser. No. 865,011
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137

254,470
ARTICLE OF FLATWARE
William J. Knope, 153 Cottage St., Meriden, Conn. 06450
Division of Ser. No. 838,931, Oct. 3, 1977. This application May 25, 1979, Ser. No. 42,702
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137

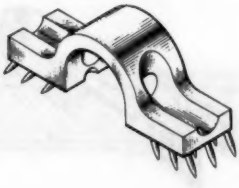


254,471
ROTARY CLOTHES HOIST
Terence D. Seabrook, Edwardstown, Australia, assignor to Hills Industries Limited, Edwardstown, Australia
Filed Jun. 14, 1976, Ser. No. 695,642
Claims priority, application Australia, Mar. 5, 1976, 68743/76
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—196

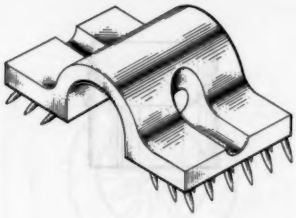
254,472
CARPET INSTALLING TOOL
Patrick W. Finucane, 287 Rosalie La., Palatine, Ill. 60067, and William A. Malvasio, 608 S. Browns Lake Dr., Burlington, Wis. 52105
Filed Feb. 6, 1978, Ser. No. 875,248
Term of patent 14 years
Int. Cl. D08—*05*
U.S. Cl. D8—15



254,473
CARPET INSTALLING TOOL
Patrick W. Finucane, 287 Rosalie La., Palatine, Ill. 60067, and William A. Malvasio, 608 S. Browns Lake Dr., Burlington, Wis. 52105
Filed Feb. 6, 1978, Ser. No. 875,249
Term of patent 14 years
Int. Cl. D08—*05*
U.S. Cl. D8—15

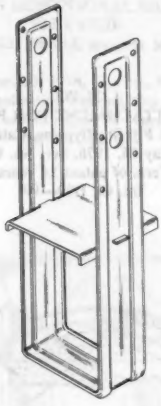


254,474
CARPET INSTALLING TOOL
Patrick W. Finucane, 287 Rosalie La., Palatine, Ill. 60067, and William A. Malvasio, 608 S. Browns Lake Dr., Burlington, Wis. 52105
Filed Feb. 6, 1978, Ser. No. 875,250
Term of patent 14 years
Int. Cl. D08—*05*
U.S. Cl. D8—15



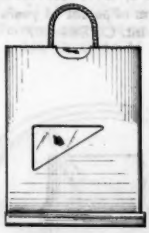
254,475
CAN OPENER
George F. Stover, 204 East Dr., Lebanon, Ind. 46052
Filed Feb. 22, 1977, Ser. No. 770,941
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—18

254,476
ARCHITECTURAL POST BASE
Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.
Filed Nov. 17, 1977, Ser. No. 852,586
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354



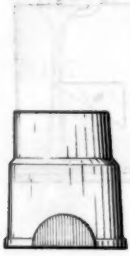
254,477
COMBINED BOTTLE AND SQUEEGEE
Frank J. Mack, Kinnelon, N.J., assignor to American Home Products Corp., New York, N.Y.
Filed Jun. 9, 1977, Ser. No. 805,200
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—10

254,478
PANTYHOSE PACKAGE
Barry G. Carroll, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed Sep. 2, 1977, Ser. No. 830,495
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193

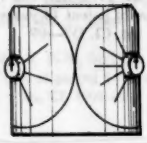


254,479
PACKAGING CONTAINER OR SIMILAR ARTICLE
Arthur L. Eilertson, Ipswich, Mass., assignor to Textron, Inc., Providence, R.I.
Filed Jul. 18, 1977, Ser. No. 816,605
Term of patent 14 years
Int. Cl. D09—*03*
U.S. Cl. D9—224

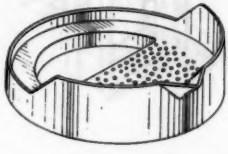
254,480
CLOSURE
Ned J. Smalley, Perrysburg, Ohio, assignor to Owens-Illinois, Inc.
Filed Oct. 3, 1977, Ser. No. 838,514
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—254



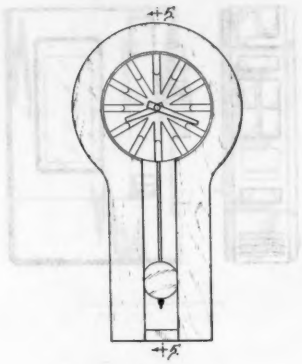
254,481
DISPENSING INDICATOR FOR A CONTAINER
Bette J. Hull, 78 Bartley Bull Pkwy., Brampton, Ontario, Canada (L6W 2J6)
Filed Mar. 21, 1978, Ser. No. 888,883
Term of patent 14 years
Int. Cl. D09—*99*
U.S. Cl. D9—260



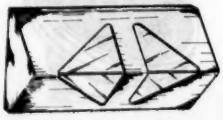
254,482
POURING ATTACHMENT FOR PAINT CANS
Charles J. Bell, 5984 Fiji St., Cypress, Calif. 90630
Filed May 26, 1978, Ser. No. 909,999
Term of patent 14 years
Int. Cl. D09—*99*
U.S. Cl. D9—290



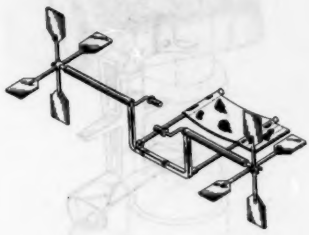
254,483
CLOCK
Richard K. Thomas, Elk Grove Village, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Nov. 9, 1977, Ser. No. 849,909
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—1



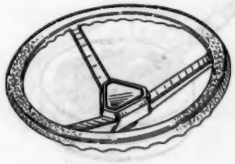
254,484
UP AND DOWN DIRECTIONAL SIGNAL FOR AN ELEVATOR
Pekka Perjo, Helsinki, Finland, assignor to Kone Osakeyhtio, Helsinki, Finland
Filed Apr. 10, 1978, Ser. No. 895,867
Claims priority, application Finland, Dec. 8, 1977, 77731
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—108



254,485
PADDLE WHEEL APPARATUS
Roger C. Stevens, 5900 Camden Ave. North, Brooklyn Center, Minn. 55430
Filed Jan. 12, 1978, Ser. No. 869,030
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—70



254,486
STEERING WHEEL
Gregg C. Montgomery, Hinsdale, and Robert A. Skyer, Palatine, both of Ill., assignors to International Harvester Company, Chicago, Ill.
Filed Feb. 21, 1978, Ser. No. 879,168
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—176



254,487

HIGH VOLTAGE FUSE END FITTING

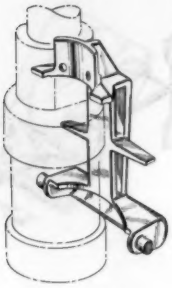
Bruce A. Biller, Chicago, and Henry W. Scherer, Mount Prospect, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed Sep. 27, 1977, Ser. No. 837,242

Term of patent 14 years

Int. Cl. D13—*03*

U.S. Cl. D13—35



254,488

MACHINE CONTROL FOOT PEDAL OR THE LIKE

Vincent Giannotti, Jr., and Charles R. Leach, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1978, Ser. No. 938,552

Term of patent 14 years

Int. Cl. D13—*03*

U.S. Cl. D13—36

254,489

CASSETTE TAPE RECORDER AND PLAYER OR SIMILAR ARTICLE

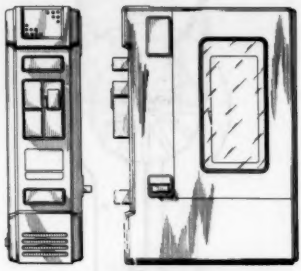
Richard Culbertson, Manlius, N.Y., assignor to General Electric Company

Filed Sep. 26, 1977, Ser. No. 836,407

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D14—6



254,490

LOUDSPEAKER WITH GRILLE

Hideyuki Matsubara, Tokyo, Japan, assignor to Pioneer Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1978, Ser. No. 959,197

Claims priority, application Japan, May 10, 1978, 53-19178

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D14—30

254,491

HIGH FREQUENCY LOUDSPEAKER

Gary C. Gillum, Hope, Ark., assignor to Klipsch and Associates, Inc., Hope, Ark.

Filed Nov. 14, 1977, Ser. No. 851,537

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—35

254,492

DUAL MAGNETIC DISC-CONSOLE UNIT FOR AN ELECTRONIC TYPING SYSTEM

Wayne C. Cathey, Bedford, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 29, 1977, Ser. No. 837,775

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—46

254,493

STORED NUMBER TELEPHONE DIALING UNIT

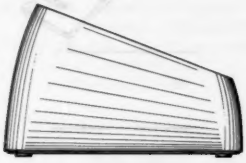
Raymond A. Grosso, Troy, and Alfred J. Prizlow, Bloomfield Hills, both of Mich., assignors to Microelectronic Communications Corp., Madison Heights, Mich.

Filed Jan. 23, 1978, Ser. No. 871,418

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—66



254,494

CHEESE VAT

Donald G. Worden, Beaver Dam, Wis., assignor to Stainless Steel Fabricating, Inc., Columbus, Wis.

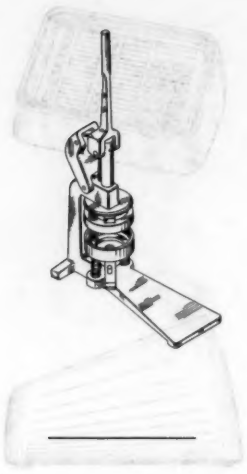
Filed Apr. 17, 1978, Ser. No. 896,918

Term of patent 14 years

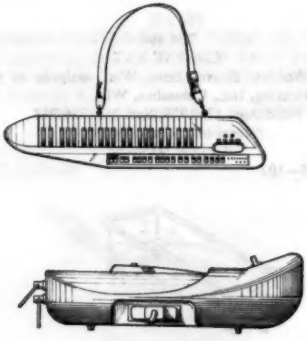
Int. Cl. D15—*08*

U.S. Cl. D15—102

254,495
MACHINE FOR ASSEMBLING BUTTONS
Malcolm J. Roebuck, LaSalle, Ill., assignor to Badge-A-Minit Ltd., LaSalle, Ill.
Filed Nov. 13, 1978, Ser. No. 959,871
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—122

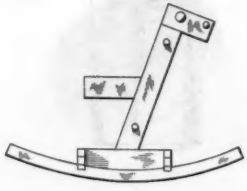


254,496
KEYBOARD INSTRUMENT FOR USE WITH A REMOTE SYNTHESIZER OR THE LIKE
Jeremy R. Hill, 87 Centre St., Dover, Mass. 02030
Filed Jan. 31, 1977, Ser. No. 763,997
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D17—1

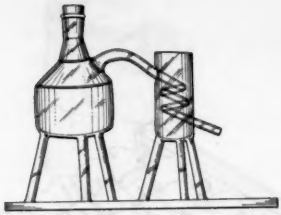


254,497
FONT OF ILLUSTRATION FIGURES FOR CHILDREN'S STORIES AND CARDS
Avis M. Dickey, South Milford, Ind., assignor to Dickey, Inc., South Milford, Ind.
Filed May 12, 1977, Ser. No. 796,208
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D18—33

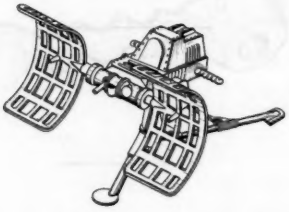
254,498
ROCKING HORSE
Robert H. Chich, 8855 N. Spruce Rd., Milwaukee, Wis. 53217
Filed Sep. 15, 1977, Ser. No. 833,601
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—70



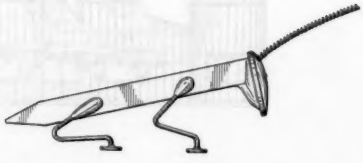
254,499
TOY DISTILLER
Ernest C. Steed, 4228 Manuela Ave., Palo Alto, Calif. 94306
Filed Jun. 20, 1977, Ser. No. 808,246
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—109



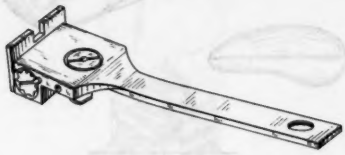
254,500
TOY SCANNER PACK
Fred D. Eddins, Mapleville, R.I., assignor to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Nov. 28, 1977, Ser. No. 856,025
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—109



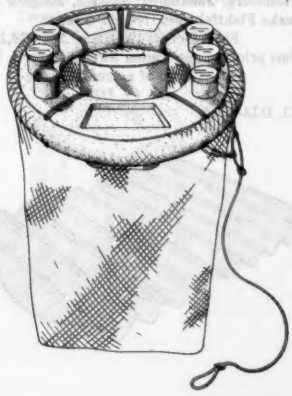
254,501
FIGURINE
Robert Hosek, 29 Albert St., Peru, Ind. 46970
Filed May 1, 1978, Ser. No. 901,737
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—185



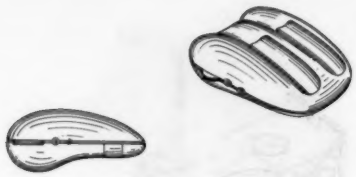
254,502
GUN SIGHT
Austin F. Behlert, 33 Herning Ave., Cranford, N.J. 07016
Filed Jan. 10, 1978, Ser. No. 868,305
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—8



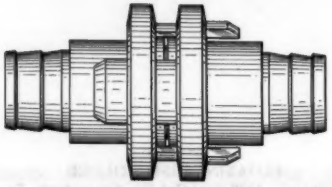
254,503
FLOATING FISH HOLDER
Lupe S. Belasquez, 4238 Wild Oak Dr., San Antonio, Tex. 78219
Filed Jun. 13, 1977, Ser. No. 806,011
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—18



254,504
GALVANIC SKIN RESISTANCE/TEMPERATURE BIOFEEDBACK DEVICE
Harold K. Myers, 4300 deMaisonneuve Blvd., W. Montreal, Quebec, Canada
Filed Mar. 27, 1978, Ser. No. 890,216
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

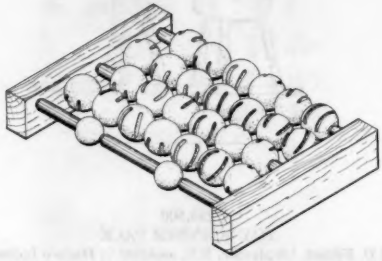


254,505
HOSE COUPLING
Frederick L. Parsons, 759 Morningside Rd., Ridgewood, N.J. 07450, and William G. Atkinson, Jr., Saddle River, N.J., assignors to Frederick L. Parsons
Filed Apr. 28, 1977, Ser. No. 792,024
Term of patent 7 years
Int. Cl. D23—*01*
U.S. Cl. D23—44

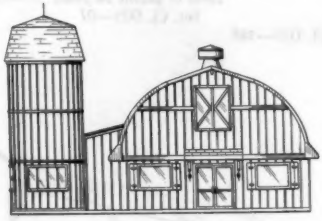


254,506
CORRUGATED METAL SHEET CONTACT BODY FOR HUMIDIFIERS
Roy Holmberg, Jönköping, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden
Filed Oct. 3, 1977, Ser. No. 839,219
Claims priority, application Sweden, Apr. 1, 1977, 77-0750
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—146

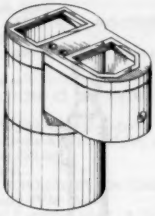
254,507
FOOT MASSAGER
James Redding, 320 Palo Alto Ave., Palo Alto, Calif. 94301
Filed Feb. 13, 1978, Ser. No. 877,420
Term of patent 3½ years
Int. Cl. D28—*03*
U.S. Cl. D24—36



254,508
BUILDING
Howard Cooper, Chicago, Ill., assignor to Barn and Silo Stores Inc., Chicago, Ill.
Filed Nov. 28, 1978, Ser. No. 964,352
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—14



254,509
HOUSING FOR A PUMP LIFT STATION
Richard J. Migchelbrink, Jr., Uniontown, Ohio, assignor to Lindsay Excavating & Concrete Products Company
Filed Aug. 17, 1977, Ser. No. 825,415
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—36

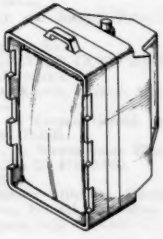


254,510
PIPE
Luther L. Shaak, State College, Pa., assignor to Quickdraw Accessories, Inc., State College, Pa.
Filed Dec. 30, 1977, Ser. No. 866,463
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

254,511
REARING TANK
Dale E. Young, II, Rte. 4, Box 4915-Z, Juneau, Ak. 99803; David K. Elie, 13551 35th Ave. NE., Seattle, Wash. 98125, and Peter K. Schoening, 5807 NE. 151st Ave., Bothell, Wash. 98011
Filed Jan. 30, 1978, Ser. No. 873,228
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—6

254,512
LAMP
Milton Leathers, 1210 Petree #233, El Cajon, Calif. 92020
Filed Nov. 10, 1977, Ser. No. 850,494
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—51

254,513
HAND HELD SPOTLIGHT
Larry K. Dart, Costa Mesa, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Mar. 20, 1978, Ser. No. 890,700
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—50



254,514

COMBINED POWER FAILURE LIGHT AND FLASH LIGHT

Thomas H. Nicholl, 1204 W. 27th St., Kansas City, Mo. 64108; Donald L. Rohrs, Overland Park, Kans., and John J. Collins, Kansas City, Mo., assignors to Thomas H. Nicholl, Kansas City, Mo.

Filed May 19, 1978, Ser. No. 907,606
Term of patent 14 years
Int. Cl. D26—*05, 02*
U.S. Cl. D26—26

254,515

HAND HELD EXAMINATION LAMP WITH DISPOSABLE TIP

John F. Guth, St. Petersburg, Fla., assignor to Concept, Inc., Clearwater, Fla.

Filed Nov. 23, 1977, Ser. No. 854,400
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—49

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TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF MARCH, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Akers Mek. Versted: *See*—
van Nes, Hadriaan, 4,193,713, Cl. 405-159.000.

A/S Alfred Benzon: *See*—
Bechgaard, Helle; and Pedersen, Arne M., 4,193,985, Cl. 424-19.000.

A/S Hoyer-Ellefsen: *See*—
Gjerde, Trygve, 4,193,714, Cl. 405-204.000.

A-T-O Inc.: *See*—
John, Frank T., 4,193,964, Cl. 422-90.000.

Aario, Matti, to Oy Tampella AB. Classifying apparatus for a suspension. 4,193,865, Cl. 209-240.000.

AB Bonnierforetagen: *See*—
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AB Svensk Varmematning SVM: *See*—
Noren, Kjell S.; and Karlsson, Stig I., 4,194,180, Cl. 340-183.000.

Abe, Kiyomi; and Takahashi, Hiromichi, to Pentel Kabushiki Kaisha. Capacitively coupled tablet. 4,194,083, Cl. 178-18.000.

Abe, Seiji, to Kabushiki Kaisha Nihon Kensho. Rhythmic exercising apparatus. 4,193,595, Cl. 273-1.00R.

Abel, Martin L., to Permawick Company, Inc. Method of forming a bearing contactor. 4,193,960, Cl. 264-128.000.

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Abels, Michael, to Micro Tec Instrumentation Inc. Detectable medical and surgical implements. 4,193,405, Cl. 128-296.000.

Aberg, Ulf: *See*—
Cederqvist, Gunnar; and Aberg, Ulf, 4,193,841, Cl. 162-152.000.

Abex Corporation: *See*—
Allen, John W., 4,193,349, Cl. 410-7.000.

ACF Industries, Incorporated: *See*—
Dye, S. Owen, 4,193,946, Cl. 261-39.00B.
Eilers, Barney A., 4,193,581, Cl. 251-328.000.
Kemp, Willard E., 4,193,577, Cl. 251-167.000.
Malo, Lowell L., 4,193,480, Cl. 188-52.000.
Niggemeier, Joseph F.; and Yeates, Richard P., 4,193,350, Cl. 410-64.000.

Acker, Richard C.: *See*—
Sarson, Charles R.; and Acker, Richard C., 4,193,616, Cl. 285-39.000.

Ackley, Charles E., Jr.: *See*—
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,193,343, Cl. 101-35.000.

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Acme General Corporation: *See*—
Jerila, Torsti T. T., 4,193,619, Cl. 292-168.000.

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Reid, Walter L., Jr.; Delano, Ralph L.; and Jepson, John W., 4,193,601, Cl. 273-167.00R.

Adam, Colin M.; and Bennett, Clive G., to Comalco Aluminium (Bell-bay) Limited. High strength aluminium base alloys. 4,193,822, Cl. 148-3.000.

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Adamson, John S., to Chevron Research Company. Transducer system for continuous monitoring liquid levels in storage tanks and the like. 4,194,177, Cl. 340-152.00T.

Adelstein, Gilbert W., to G. D. Searle & Co. 1-(3,3-Diaryl-3-oxadiazolalkyl)-4-phenyl-4-piperidinomethanols and related compounds. 4,194,045, Cl. 546-209.000.

Adicoff, Arnold; Finnegan, William G.; McBride, William R.; and Ayres, William M., to United States of America, Navy. Extrusion of solid propellant including ammonium perchlorate whiskers. 4,193,952, Cl. 264-3.00B.

AFA Corporation, The: *See*—
Dunn, C. E. Lee, Jr.; and Miller, Carl A., 4,193,509, Cl. 215-330.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Lewiner, Jacques; Dreyfus, Gerard; and Perino, Didier, 4,194,189, Cl. 340-373.000.

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Muller, Jurgen; Pfeifer, Josef; Rheude, Alfred; Erckel, Rolf; Farber, Heinrich; and Zrenner, Bernhard, 4,193,682, Cl. 355-10.000.

Agocs, Pal; Fabian, Istvan; Gajdacsi, Andras; Nagy, Sandor; and Pinter, Zoltan, to Eszakmagyarorszagi Vegyimuvek. Substituted-1,2,4-oxadiazolidine-3-one derivatives. 4,193,922, Cl. 548-132.000.

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Lileck, John T.; Papinsick, John; and Steigerwalt, Edward J., 4,193,976, Cl. 423-406.000.

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Sakakibara, Naoji; and Hashimoto, Nobuyuki, 4,193,421, Cl. 137-625.330.

Aizawa, Masanobu, to Stanley Electric Co., Ltd. Socket for mounting an electric lamp on a printed circuit board. 4,193,653, Cl. 339-17.00D.

Akers, Larry D.: *See*—
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Al-Kufaishi, Hassan A. Unified English pronouncing alphabet. 4,193,212, Cl. 35-35.00R.

Alar Engineering Corporation: *See*—
White, Harold R.; and Doncer, Alexander J., Jr., 4,193,871, Cl. 210-142.000.

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Alcan Aluminum Corporation: *See*—
Chalmers, Alexander A.; Gailey, J. Lynn; and Wollam, Carl A., 4,193,238, Cl. 52-211.000.

Alcan Research and Development Limited: *See*—
Thorburn, Herbert J.; and Tracy, John A., 4,193,440, Cl. 164-432.000.
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Bodelson, Berth I. A.; and Nordenberg, Mats B., 4,193,537, Cl. 233-20.00A.

Allen, Curtis L.: *See*—
Adams, Charles C.; Allen, Curtis L.; and Besenbruch, Gottfried E. A., 4,194,027, Cl. 427-249.000.

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Gore, Robert W.; and Allen, Samuel B., Jr., 4,194,041, Cl. 428-315.000.

Alley, Don B.: *See*—
Keller, Vernon P.; Alley, Don B.; and Majoewsky, Steven T., 4,193,478, Cl. 187-29.00R.

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Baker, Josefina T.; Cooke, Robert S.; and Sifniades, Stylianos, 4,194,038, Cl. 528-182.000.
Cachia, Joseph M., 4,193,613, Cl. 280-804.000.
Marshall, Robert M., 4,193,880, Cl. 252-8.800.
Phillips, Benjamin A., 4,193,268, Cl. 62-101.000.
Tuccio, Sam A., 4,193,855, Cl. 204-158.00R.

Allison, David F.: *See*—
Youmans, Albert P.; Allison, David F.; and Maxwell, David A., 4,193,836, Cl. 156-657.000.

Almsted, Richard; and Ellertson, Verlyn V. Window cap. 4,193,232, Cl. 52-98.000.

Alner, Henry G. H.: *See*—
Ruscoe, Colin N. E.; Alner, Henry G. H.; and Baldwin, Brian C., 4,194,001, Cl. 424-273.00R.

Alpers, Frederick C., to United States of America, Navy. High resolution microwave seeker. 4,194,204, Cl. 343-7.400.

Alpha Industries, Inc.: *See*—
Borzym, Alexander; and Borzym, John J., 4,193,486, Cl. 193-35.00R.

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Griffith, Harold J., 4,193,535, Cl. 229-52.00B.

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Hsieh, Hsiun P.; and Koenig, James J., 4,193,908, Cl. 260-40.00R.

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Langston, Jimmy B.; Leeper, Harold; and Wong, Patrick S., 4,193,403, Cl. 128-275.000.

Aman, Robert C., Jr., to Westinghouse Electric Corp. Reversible gerotor pump. 4,193,746, Cl. 418-32.000.

Amanuma, Takahiko: *See*—
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; and Sagara, Seiji, 4,193,483, Cl. 192-26.000.

Amax Inc.: *See*—
Fekete, Simon O.; and Meyer, Gustavo A., 4,193,969, Cl. 423-139.000.

Ambrosch, Adolf K.: *See*—
Wahrendorf, York A.; Frenzel, Herbert K.; Ambrosch, Adolf K.; Rasmussen, Knud A.; Seibert, Horst; and Dieckmann, Horst J., 4,193,718, Cl. 405-286.000.

AMCA International Corporation: *See*—
Heckelsberg, Robert E., 4,193,247, Cl. 52-713.000.

American Can Company: *See*—
Miller, Fredric N., 4,193,751, Cl. 425-83.100.
Nerod, Irving, 4,193,204, Cl. 34-4.000.

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Scott, Robert G., 4,193,161, Cl. 15-352.000.

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Giglia, Robert D.; and Clasen, Richard H., 4,193,670, Cl. 350-357.000.
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American Ecosystems, Inc.: *See*—
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American Hardware & Paint Co., Inc.: *See*—
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American Orthodontics Corporation: *See*—
Merkel, Daniel A.; Viglietti, John E.; and Gagin, William P., 4,193,195, Cl. 433-13.000.

American Seating Company: *See*—
Hartman, Arlin P., 4,193,229, Cl. 52-9.000.

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Young, Jack H.; Karle, David A.; and Halleck, Frank E., 4,193,818, Cl. 134-1.000.

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Cullum, Otis O., 4,194,031, Cl. 427-289.000.
Leeke, Gordon; and Helme, Joseph W., 4,193,876, Cl. 210-489.000.

Amneus, John S.: *See*—
Trindle, Dean D.; and Amneus, John S., 4,193,506, Cl. 215-11.00C.

AMP Incorporated: *See*—
Dittmann, Larry E.; Koch, Robert M.; Webster, Van K.; and Harris, Edwin T., 4,193,658, Cl. 339-97.00P.
Herrmann, Henry O., Jr., 4,193,655, Cl. 339-31.00R.
Hughes, Donald W. K.; and Myers, Ronald W., 4,193,654, Cl. 339-17.0LC.
Ward, John A., 4,193,656, Cl. 339-45.00M.

Anaconda Company, The: *See*—
Sullivan, Robert E.; Stern, William R.; and Vance, Bess L., 4,193,968, Cl. 423-112.000.

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Anheuser-Busch, Incorporated: *See*—
Teng, James; Lucas, James M.; and Stubits, Marcella C., 4,193,989, Cl. 424-60.000.

Anic S.p.A.: *See*—
Dozzi, Giovanni; Cucinella, Salvatore; and Mazzei, Alessandro, 4,193,939, Cl. 260-583.00R.

Ankenman, Dale E. Biased agricultural implement. 4,193,456, Cl. 172-272.000.

Ansen, Jakob; Herchenbach, Horst; Wustner, Helmut; and Fasbender, Heinz, to Klockner-Humboldt-Deutz AG. Method and apparatus for the drying and fine-grinding of coal. 4,193,554, Cl. 241-19.000.

Antibioticos: *See*—
Esteve Bianchini, Asuncion; and Palomo Coll, Antonio L., 4,193,918, Cl. 260-239.100.

Antoniades, Emilios P., to Chevron Research Company. Acetic acid from methyl formate. 4,194,056, Cl. 562-516.000.

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Yoshikawa, Akira; and Aota, Kouichi, 4,193,680, Cl. 355-3.00R.

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Apostolova, Velichka I.: *See*—
Konstantinova, Rumyana G.; Zikolova, Svetlana S.; Apostolova, Velichka I.; and Toshkova, Tanya G., 4,193,920, Cl. 260-239.30P.

Appel, Max J. G.; Carmichael, Leland E.; and Scott, Fredric W., to Cornell Research Foundation, Inc. Heterotypic canine parvovirus vaccine. 4,193,990, Cl. 424-89.000.

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LeGrand, Pierre N.; and van Dalen, Dirk J., 4,193,203, Cl. 33-180.0AT.

Aquasonic Products Corp.: *See*—
Kuris, Arthur; and Suroff, Leonard W., 4,193,196, Cl. 433-82.000.
Kuris, Arthur; and Suroff, Leonard W., 4,193,197, Cl. 433-82.000.

Arberman, Fernando. Traction-enhancing device for automotive vehicle drive wheels. 4,193,466, Cl. 180-15.000.

Arco Industries Ltd.: *See*—
D'Andrade, Bruce M.; and Tsui, Kwok Wa, 4,193,223, Cl. 46-209.000.

Argade, Shyam D.: *See*—
Kramer, David A.; Argade, Shyam D.; and Balko, Edward N., 4,193,861, Cl. 204-296.000.

Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; and Sagara, Seiji, to Canon Kabushiki Kaisha. Latch operated coil spring clutch. 4,193,483, Cl. 192-26.000.

Armour and Company: *See*—
Orlowski, Gerald J.; Wicklund, Rodney D.; Sandlas, Richard D.; and Weibler, Walter W., 4,193,167, Cl. 17-32.000.

Armstrong, Alvin H. Photographic printing and print identifying apparatus. 4,193,684, Cl. 355-40.000.

Armstrong Cork Company: *See*—
Kauffman, William J.; and Lilley, George L., 4,193,957, Cl. 264-46.400.

Armstrong, Roy; and Kahn, William M., to Armstrong, Roy. Cribbage scoring device. 4,193,600, Cl. 273-148.00R.

Arnold, Bruce K., to International Telephone and Telegraph Corporation. Fiber optic contact alignment device. 4,193,665, Cl. 350-96.220.

Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH: *See*—
Fischer, Klaus; Flauger, Helmut; Balzer, Kurt; and Fischer, Roland, 4,193,742, Cl. 417-295.000.

Asahi, Kunihiko: *See*—
Inoue, Morio; Itoh, Kunio; and Asahi, Kunihiko, 4,193,835, Cl. 156-606.000.

Asano, Masao: *See*—
Iwama, Hideaki; Koyama, Mikio; Tsuda, Yasuo; and Asano, Masao, 4,193,800, Cl. 430-213.000.

ASEA Aktiebolag: *See*—
Forslund, Lennart; Jordinger, Stig; and Kolavcic, Pavel, 4,193,294, Cl. 73-141.00A.
Johansson, Bengt; and Nilsson, Erland, 4,194,138, Cl. 313-3.000.

Ashland Oil, Inc.: *See*—
Lundberg, John A.; Schafer, Robert J.; Toeniskoetter, Richard H.; and Pelfrey, Richard L., 4,193,909, Cl. 260-42.150.
Whittington, Lawrence E.; Deviney, Marvin L., Jr.; Lewis, James E.; and Chapman, Duane K., 4,193,900, Cl. 260-28.50B.

Atlantic Richfield Company: *See*—
Wohlmut, Peter G., 4,193,819, Cl. 136-89.0PC.

Audykowski, Thaddeus; and Moser, Roland, to Ciba-Geigy Corporation. Curable epoxide resin mixtures containing diaminopropanes. 4,193,905, Cl. 260-30.60R.

Aulich, Hubert; Grabmaier, Josef; and Eisenrith, Karl-Heinz, to Siemens Aktiengesellschaft. Device for drawing a group of cladded light conducting fibers. 4,193,782, Cl. 65-11.00R.

Avrameas, Stratis; and Ternynck, Therese M. F., to Etablissement DeClare d'Utilite Publique dit: Institut Pasteur. Process for coupling biological substances by covalent bonds. 4,193,982, Cl. 424-12.000.

Awane, Katunobu; Hattori, Hironori; Biwa, Tetuo; and Tamaki, Hiroshi, to Sharp Kabushiki Kaisha. Integration of high voltage driver and low voltage logic in a semiconductor device. 4,194,214, Cl. 357-41.000.

Awaya, Juichi: *See*—
Omura, Satoshi; Tanaka, Haruo; Awaya, Juichi; and Hata, Toju, 4,194,064, Cl. 435-125.000.

Ayres, William M.: *See*—
Adicoff, Arnold; Finnegan, William G.; McBride, William R.; and Ayres, William M., 4,193,952, Cl. 264-3.00B.

Aziende Colori Nazionali Affini Acna S.p.A.: *See*—
Cipolli, Roberto; and Boffa, Gioacchino, 4,193,763, Cl. 8-21.00C.

B. F. Goodrich Company, The: *See*—
Powell, Joe A., 4,193,437, Cl. 152-330.0RF.

Baatz, Gunther; Schafer, Walter; and Dahm, Manfred, to Bayer Aktiengesellschaft. Microencapsulation with modified aliphatic polyisocyanates. 4,193,889, Cl. 252-316.000.

Baba, Koji: *See*—
Nanaumi, Kazuyuki; and Baba, Koji, 4,193,443, Cl. 165-66.000.

Babcock-Brown Boveri Reaktor GmbH: *See*—
Womack, Robert E.; Lawrie, William E.; and Jester, Alfred, 4,193,843, Cl. 176-19.0LD.

Babcock & Wilcox Company, The: *See*—
Holt, Amos E.; Wehrmeister, Allen E.; and Whaley, Hubert L., 4,194,149, Cl. 324-220.000.

Bachman, Gerald L.; and Vineyard, Billy D., to Monsanto Company. Asymmetric catalysis. 4,194,051, Cl. 560-60.000.

Back, Gerhard; and Fasciati, Alfred, to Ciba-Geigy Corporation. Sulfo- or carboxy-aryl amino sulfonyl phenyl azo hydroxpyridine heavy metal complex dyes. 4,193,916, Cl. 260-146.00R.

Badger Company, Inc., The: *See*—
Dauphine, Thonet C., 4,193,451, Cl. 166-248.000.

Baer, Ralph H.; and Cope, Leonard D., to Sanders Associates, Inc. Digital preprogrammed television game system. 4,194,198, Cl. 340-724.000.

Bailey, Harold A., to Libbey-Owens-Ford Company. Glass sheet bending mold apparatus. 4,193,785, Cl. 65-285.000.

Baker, Dennis S.; and Davies, Glyndwr J., to Glacier Metal Company, Limited. Plain bearings. 4,193,645, Cl. 308-23.000.

Baker, Don R., to Stauffer Chemical Company. Benzodioxane herbicides. 4,193,787, Cl. 71-88.000.

Baker, Gerald S.; and Hahn, Guerry L., to Cameron Iron Works, Inc. Apparatus for indicating subsea well head pressure. 4,193,307, Cl. 73-701.000.

Baker, Josefina T.; Cooke, Robert S.; and Sifniades, Stylianos, to Allied Chemical Corporation. Poly(ester-carbonates) from dicarboxylic acid chlorides. 4,194,038, Cl. 528-182.000.

Baker, Raymond J. Pool ball separator. 4,193,596, Cl. 273-11.00C.

Baldwin, Brian C.: *See*—
Ruscoe, Colin N. E.; Alner, Henry G. H.; and Baldwin, Brian C., 4,194,001, Cl. 424-273.00R.

Balko, Edward N.: *See*—
Kramer, David A.; Argade, Shyam D.; and Balko, Edward N., 4,193,861, Cl. 204-296.000.
Ball Corporation: *See*—
Frame, Wayne W., 4,194,220, Cl. 358-221.000.
Ballard, Raymond M., to Du Pont de Nemours, E. I., and Company. Film web winding assembly. 4,193,559, Cl. 242-67.10R.
Ballu, Vincent P. M., to Tecnoma. Mobile apparatus for spreading liquids at a constant volume per unit surface area. 4,193,547, Cl. 239-156.000.
Balzer, Kurt: *See*—
Fischer, Klaus; Flauger, Helmut; Balzer, Kurt; and Fischer, Roland, 4,193,742, Cl. 417-295.000.
Ban, Keisuki: *See*—
Yamazaki, Shuichi; and Ban, Keisuki, 4,193,749, Cl. 418-201.000.
Ban, Thomas E.; and Marlowe, William H., to McDowell-Wellman Company. Recovery of oil and gas from oil shale. 4,193,862, Cl. 208-11.00R.
Bannister, Michael J.; McKinnon, Neil A.; and Hughan, Robert R., to Commonwealth Scientific and Industrial Research Organization. Oxygen sensors. 4,193,857, Cl. 204-195.00S.
Barber, Everett M.: *See*—
Muenger, James R.; and Barber, Everett M., 4,193,259, Cl. 60-39.040.
Bareau, Alain, to Compagnie International pour l'Informatique. Arrangement for converting digital signals representing characters into a self-locking dot representation. 4,194,190, Cl. 340-407.000.
Barnes, Johney H.; and Barnes, Lucynda D. Well shut off device. 4,193,574, Cl. 251-1.00A.
Barnes, Lucynda D.: *See*—
Barnes, Johney H.; and Barnes, Lucynda D., 4,193,574, Cl. 251-1.00A.
Barnett, Gordon R. Method for removing ova from animals. 4,193,392, Cl. 128-1.00R.
Barratt, Don C. Disposable receiver. 4,193,496, Cl. 206-380.000.
Barrett, Fred, to Establissment Halgar. Manufacturing process of a thin metal sheet by electrolytic deposit. 4,193,846, Cl. 204-13.000.
Barry, Vincent T., to Carrier Corporation. Apparatus for supplying a cooling liquid to a condenser of a refrigeration unit. 4,193,269, Cl. 62-171.000.
Barto, LeRoy. Prefabricated wall or ceiling assembly. 4,193,239, Cl. 52-222.000.
Barton, Derek H. R.; Long, Alan G.; Looker, Brian E.; Wilson, Edward M.; and Elphinstone, William G., to Glaxo Laboratories, Limited. Chemical compounds. 4,193,917, Cl. 260-239.00A.
BASF Wyandotte Corporation: *See*—
Kramer, David A.; Argade, Shyam D.; and Balko, Edward N., 4,193,861, Cl. 204-296.000.
Baudendistel, Hermann, deceased: *See*—
Vetter, Klaus; and Baudendistel, Hermann, deceased, 4,193,732, Cl. 414-609.000.
Baudendistel, Rosemarie, heir: *See*—
Vetter, Klaus; and Baudendistel, Hermann, deceased, 4,193,732, Cl. 414-609.000.
Bauer, Kurt; Harder, Ulli; and Sturm, Wolfgang, to Haarmann & Reimer GmbH. Nitriles with odorant properties. 4,193,934, Cl. 260-465.00R.
Bauer, Philip J. Organizer for dental clamps. 4,193,198, Cl. 433-77.000.
Baulard-Caugan, Raymond G. Double-acting single-web swimming apparatus. 4,193,371, Cl. 115-22.200.
Baum, John W., to General Electric Company. Coin-operated washing machine cycle time reducer. 4,193,488, Cl. 194-9.00T.
Baumann, Marcus; Kvita, Vratislav; Roth, Martin; and Waterhouse, John S., to Ciba-Geigy Corporation. Imidyl compounds. 4,193,927, Cl. 260-326.260.
Baur, Rudolf, to Swiss Aluminium Ltd. Lubricant for metal strip. 4,193,881, Cl. 252-17.000.
Bayer Aktiengesellschaft: *See*—
Baatz, Gunther; Schafer, Walter; and Dahm, Manfred, 4,193,889, Cl. 252-316.000.
Dieterich, Dieter, 4,194,035, Cl. 528-67.000.
Enders, Edgar; Stendel, Wilhelm; and Hammann, Ingeborg, 4,194,008, Cl. 424-322.000.
Forster, Heinz; Klusacek, Hans; and Wenz, Arthur, 4,194,054, Cl. 562-493.000.
Niemers, Ekkehard; Wollweber, Hartmund; Kolling, Heinrich; and Thomas, Herbert, 4,194,004, Cl. 424-300.000.
Reischl, Artur; Hombach, Rudolf; and Dollhausen, Manfred, 4,193,832, Cl. 156-331.000.
Sirrenberg, Wilhelm; Klauke, Erich; Schramm, Jurgen; Hammann, Ingeborg; and Stendel, Wilhelm, 4,194,005, Cl. 424-304.000.
Tacke, Peter; Neuray, Dieter; and Michael, Dietrich, 4,193,907, Cl. 260-37.00N.
Wedemeyer, Karlfried; Kiel, Wolfgang; and Evertz, Werner, 4,193,937, Cl. 260-570.00R.
Wingler, Frank; Eicher, Theobald; Muller, Friedemann; Fischer, Winfried; and Prinz, Richard, 4,193,897, Cl. 260-17.00R.
Bayshore Creative Products, Inc.: *See*—
Havens, Glenn G., 4,193,545, Cl. 239-109.000.
BBC Brown Boveri & Company Limited: *See*—
Frutschi, Hansulrich, 4,193,266, Cl. 60-644.000.
Kurzi, Albert; and Mersiovsky, Willy, 4,193,202, Cl. 33-174.00L.
Ritter, Franz, 4,194,145, Cl. 318-799.000.
Beard, Benjamin F., III. Mobile cleaning apparatus for removing debris from the surface of parking lots and the like. 4,193,159, Cl. 15-340.000.
Beasley, Max M., to Tuftco Corporation. Low pile forming apparatus for tufting machine. 4,193,359, Cl. 112-79.00R.
Beatrice Foods Co.: *See*—
Gladstone, Joseph, 4,193,549, Cl. 239-251.000.
Bechgaard, Helle; and Pedersen, Arne M., to A/S Alfred Benzon. Multiple-units drug dose. 4,193,985, Cl. 424-19.000.
Beck, Hans, to geobra Brandstaetter GmbH & Co., KG. Toy building. 4,193,221, Cl. 46-19.000.
Becka, Michael M., to International Shoe Machine Corporation. Toe pulling over and lasting machine. 4,193,154, Cl. 12-10.100.
Becker, Dieter: *See*—
Harth, Helmut; and Becker, Dieter, 4,193,987, Cl. 424-49.000.
Beckerman, Howard L.; and Dob, Allan M., to Singer Company, The. Lint minimization in sewing machine bobbin alarm. 4,193,363, Cl. 112-278.000.
Becton, Dickinson & Company: *See*—
Malinouskas, Donald, 4,194,179, Cl. 340-211.000.
Beecham Group Limited: *See*—
Forward, Geoffrey C.; and Gawthorpe, Janet A., nee Baylis, 4,193,988, Cl. 424-52.000.
Goudie, Alexander C., 4,194,010, Cl. 424-341.000.
Bell Telephone Laboratories, Incorporated: *See*—
Bosik, Barry S., 4,194,091, Cl. 179-77.000.
Carides, James N.; and Murphy, Donald W., 4,194,062, Cl. 429-194.000.
Fitzgerald, John D., 4,193,177, Cl. 29-56.600.
Van Horn, Robert H., 4,193,201, Cl. 339-98.000.
Belokin, Paul, Jr. Display rack assembly. 4,193,351, Cl. 108-59.000.
Ben-Gurion University of the Negev Research & Development Authority: *See*—
Loeb, Sidney, 4,193,267, Cl. 60-649.000.
Bendix Corporation, The: *See*—
Marchak, Roman O.; and Peterson, William A., Jr., 4,193,380, Cl. 123-32.0EG.
Benincasa, John J.; and Hage, Marvin L., to United Technologies Corporation. Boat designed to withstand the force of underwater explosions. 4,193,367, Cl. 114-68.000.
Bennett, Clive G.: *See*—
Adam, Colin M.; and Bennett, Clive G., 4,193,822, Cl. 148-3.000.
Bensoam, Jean: *See*—
Muller, Alain; Mathey, Francois; and Bensoam, Jean, 4,193,978, Cl. 423-648.00R.
Bent, Michael F.: *See*—
Whiteley, Glenn R.; and Bent, Michael F., 4,193,199, Cl. 33-1.0PT.
Berber, Viktor A.; Pervushin, Evgeny S.; Murtazin, Khafiz M.; Kholin, Vladimir G.; and Galishnikov, Boris M. Apparatus for calibrating instruments for granulometric recording. 4,193,288, Cl. 73-1.00R.
Bergman, Richard C.: *See*—
Rich, Joseph W.; and Bergman, Richard C., 4,194,169, Cl. 331-94.50G.
Berkowitz, Milton. Hanger for hanging fabric. 4,193,504, Cl. 211-119.000.
Bernard, Jean-Pierre L.: *See*—
Devienne, Andre M.; Igea, Gilbert L.; and Bernard, Jean-Pierre L., 4,193,429, Cl. 141-4.000.
Bernard, Vincent E. Portion controlled frozen food. 4,193,272, Cl. 62-320.000.
Bernardi, Carl E., to National Semiconductor Corporation. Automatic taping machine. 4,193,834, Cl. 156-521.000.
Berseth, Michel, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Starting block switch assembly for timed swimming events. 4,194,101, Cl. 200-52.00R.
Bertelli, Guido; Roma, Pierpaolo; and Locatelli, Renato, to Montedison S.p.A. Self-extinguishing polymeric compositions, 4,193,945, Cl. 525-2.000.
Besenbruch, Gottfried E. A.: *See*—
Adams, Charles C.; Allen, Curtis L.; and Besenbruch, Gottfried E. A., 4,194,027, Cl. 427-249.000.
Bessin, Pierre: *See*—
Laforest, Jacqueline; Bonnet, Jacqueline; and Bessin, Pierre, 4,194,003, Cl. 424-274.000.
Biglin, Timothy J., to Horstmann Gear Company Limited, The. Ripple control systems. 4,194,128, Cl. 307-3.000.
Bille, Heinz, to Maschinenfabrik Walter Scheele KG. Oscillatory pump for the transport of viscous materials. 4,193,743, Cl. 417-481.000.
Bindhoff, Eduardo W.: *See*—
Lamberton, Bruce A.; and Bindhoff, Eduardo W., 4,193,461, Cl. 175-19.000.
Birum, Gail H.; and Jansen, Richard F., to Monsanto Company. Phosphorus-containing propionates. 4,193,914, Cl. 260-45.85R.
Bishop, Arthur E. Machine for manufacturing variable ratio racks. 4,193,722, Cl. 409-59.000.
Bishow, Raymond L. Rocking, turning toy. 4,193,592, Cl. 272-114.000.
Bissett, Fred L. Ski device. 4,193,609, Cl. 280-12.00K.
Biwa, Tetuo: *See*—
Awane, Katunobu; Hattori, Hironori; Biwa, Tetuo; and Tamaki, Hiroshi, 4,194,214, Cl. 357-41.000.
Bjorklund, Fritz L. G.; Sandberg, Carl-Olof; Sternbeck, Olaf; and Wern, Lars A., to Telefonaktiebolaget L M Ericsson. Two-terminal network comprising a transistor. 4,194,134, Cl. 307-255.000.
Bjorklund, Tom B., to AB Bonnierforetagen. Process for quantitative determination of CAPA antigen or antibody. 4,193,981, Cl. 424-12.000.
Black, Frank M. Columnar contaminant remover. 4,193,205, Cl. 34-9.000.

Black, James L., to Merichem Company. Liquid sealing apparatus for sealing vapors in a tank. 4,193,967, Cl. 422-170.000.

Blaschke, Kurt; and Roob, Josef, to Stahl- und Apparatebau Hans Leffer GmbH. Rotary boring head. 4,193,462, Cl. 175-292.000.

Blaskowski, Henry J., to Combustion Engineering, Inc. Soot blower for pressurized furnace. 4,193,158, Cl. 15-317.000.

Blatt, John A.; and Fox, Gordon J., to Blatt, Leland Francis. Adjustable shuttle mount for presses. 4,193,731, Cl. 414-589.000.

Blatt, Leland Francis: *See*—
Blatt, John A.; and Fox, Gordon J., 4,193,731, Cl. 414-589.000.

Blendax-Werke R. Schneider GmbH & Co.: *See*—
Harth, Helmut; and Becker, Dieter, 4,193,987, Cl. 424-49.000.

Blessing, Hubert, to Levi Strauss & Co. Toggle controlled servo system. 4,193,365, Cl. 112-314.000.

Bloom, Stanley M.; Hoffman, Arnold; and Norland, Kenneth S., to Polaroid Corporation. Method of electrodeposition. 4,193,847, Cl. 204-15.000.

Bochan, John, to General Electric Company. Agitator mechanism for clothes washing machine. 4,193,275, Cl. 68-134.000.

Bock, Jan: *See*—
Makowski, Henry S.; Lundberg, Robert D.; and Bock, Jan, 4,193,901, Cl. 260-28.50B.

Bodelson, Berth I. A.; and Nordenberg, Mats B., to Alfa-Laval AB. Centrifugal separator with presedimentation means. 4,193,537, Cl. 233-20.00A.

Bodin, Leslie J., to Burroughs Corporation. Automatic centering of character strings. 4,194,197, Cl. 340-711.000.

Boehler, Rolf, to Northern Telecom Limited. Rotary indexing apparatus for automatic device insertion on printed circuit boards. 4,193,186, Cl. 29-741.000.

Boffa, Gioacchino: *See*—
Cipolli, Roberto; and Boffa, Gioacchino, 4,193,763, Cl. 8-21.00C.

Bohner, Beat: *See*—
Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, 4,193,790, Cl. 71-116.000.

Boigegrain, Robert; Gachon, Michel; Maffrand, Jean-Pierre; and Maire, Gerard, to Parcor. Thieno[2,3-c] and [3,2-c]pyridines, process for their preparation and therapeutic applications thereof. 4,193,997, Cl. 424-256.000.

Bondar, Martin M.: *See*—
Rudy, Michael W.; Kramer, Edward J.; Bondar, Martin M.; and Whitney, Ronald L., 4,193,685, Cl. 355-41.000.

Bonnet, Jacqueline: *See*—
Laforest, Jacqueline; Bonnet, Jacqueline; and Bessin, Pierre, 4,194,003, Cl. 424-274.000.

Borg-Warner Corporation: *See*—
Ille, David R., 4,193,263, Cl. 60-420.000.
Kelbel, Donald W., 4,193,316, Cl. 74-477.000.

Borisuck, John F.; Coviello, William L.; and Sheedy, Gary W., to Uniroyal, Inc. Anvil for outsole slitting. 4,193,155, Cl. 12-40.000.

Borzym, Alexander; and Borzym, John J., to Alpha Industries, Inc. Double dump runout table. 4,193,486, Cl. 193-35.00R.

Borzym, John J.: *See*—
Borzym, Alexander; and Borzym, John J., 4,193,486, Cl. 193-35.00R.

Bosik, Barry S., to Bell Telephone Laboratories, Incorporated. Line feed circuit. 4,194,091, Cl. 179-77.000.

Bottussi, Elvio: *See*—
Novello, Renzo; and Bottussi, Elvio, 4,193,723, Cl. 409-122.000.

Boulanger, Henry J.; and Rizzo, Salvatore P., to Texas Instruments Incorporated. Method for mounting electrically conductive wires to a substrate. 4,193,181, Cl. 29-509.000.

Bounds, William E. Dual condiment dispenser. 4,193,521, Cl. 222-142.400.

Bourquin, George W.; and LaFontain, Louis. Fishing apparatus. 4,193,220, Cl. 43-15.000.

Bowler, Donald F. Water driven tool. 4,193,228, Cl. 51-170.00T.

Bowman, George F.; and Prescher, Kenneth A. Fluid check valve device. 4,193,417, Cl. 137-192.000.

Bowman, Raymond E.; and Greaves, Anthony, to Co-Steel International Limited. Method of slitting a double or triple stranded bar. 4,193,283, Cl. 72-204.000.

Bowman, Rodney V.; and Francis, Martin H., to NCR Corporation. Signal generator. 4,193,539, Cl. 235-92.0NG.

Boyd, Robert L.; Hamilton, David C.; Wood, Wilmer E.; Fleming, Joseph; and Wegmann, Raymond, to Ramsey Controls, Inc. Electrical mounting means for thermal conduction. 4,193,444, Cl. 165-76.000.

Boyer, David C.; Danko, Arthur J.; and Ruehl, William E., to Illinois Tool Works Inc. Idler pulley. 4,193,310, Cl. 74-230.300.

Bradam, William R., to NCR Corporation. Membrane keyboard apparatus with tactile feedback. 4,194,097, Cl. 200-5.00A.

Braddock, William A.: *See*—
Felsing, Larry E., 4,193,614, Cl. 280-804.000.

Brankling, David; and Crawford, John, to Orobis Limited. Polymer composition viscosity index improver additive and lubricating oil containing the additive. 4,194,057, Cl. 585-11.000.

Branson, Charles D.; and Shopsky, Harvey J., to Robertshaw Controls Company. Condition responsive electrical switch construction and parts and methods therefor. 4,194,102, Cl. 200-67.00D.

Brasseries Kronenbourg: *See*—
Dougados, Roland; Pierrot, Francois; and Wagner, Remy, 4,193,540, Cl. 235-454.000.

Braukmann Armaturen A.G.: *See*—
Knauss, Erwin, 4,193,542, Cl. 236-34.500.

Brazgovskaya, Alla I.: *See*—
Khodsky, Lev G.; Brazgovskaya, Alla I.; Kaminskaya, Valentina S.; and Podkletnov, Evgeny N., deceased, 4,193,808, Cl. 106-48.000.

Breiner, Frank S.: *See*—
VandenHoek, Harold L.; and Breiner, Frank S., 4,193,233, Cl. 52-122.000.

Brenner, Douglas; and Lundberg, Robert D., to Exxon Research & Engineering Co. Elastomeric systems having unusual memory characteristics. 4,193,899, Cl. 260-23.50A.

Breton, Ernest J.; Wolf, Jack D.; and Worden, Dexter, to Teti, Joseph A., Jr.; and Teti, William C., part interest to each. Article of fibrillated polytetrafluoroethylene containing high volumes of particulate material and methods of making and using same. 4,194,040, Cl. 428-308.000.

Briggs, Henry R., to Rolls-Royce Limited. Gas turbine engines. 4,193,741, Cl. 416-170.00R.

Briggs, Roger A.; and Gilpin, Jo Ann, to Dow Chemical Company, The. Process for preparing rifamycin S using a strong acid cation exchange resin. 4,193,919, Cl. 260-239.30P.

Brill, Joseph H. Process and apparatus for producing compost. 4,193,786, Cl. 71-9.000.

Brinkley, John M.: *See*—
Ullman, Edwin F.; and Brinkley, John M., 4,193,983, Cl. 424-12.000.

Bristol-Myers Company: *See*—
Hanrahan, James R.; and Levine, Richard G., 4,193,134, Cl. 2-16.000.

British Broadcasting Corporation: *See*—
Drewery, John O., 4,194,219, Cl. 358-167.000.

Britton, Thomas C.: *See*—
Trepanier, Donald L.; and Britton, Thomas C., 4,194,000, Cl. 424-270.000.

Brooks, Ronald E.: *See*—
Slusarczuk, George M. J.; and Brooks, Ronald E., 4,193,866, Cl. 210-6.000.

Brown, Joseph E., Jr. Carpet sample display case. 4,193,652, Cl. 312-280.000.

Broyles, Wayne R., to Minichillo, Ronald A., a part interest. Ladder structure. 4,193,477, Cl. 182-194.000.

Bruce-Lake Company: *See*—
Meisberger, Raymond F., 4,194,080, Cl. 174-45.00R.

Brucker, Milton; Matika, Ronald J.; and McMican, Maurice E. Wastewater and wastewater solid processing system. 4,193,869, Cl. 210-44.000.

Bruening, Wilhelm; de Andrade Bruening, Inai M. R.; and Martinez Concha, Francisco J., to Petroleo Brasileiro S.A.-Petrobras. Apparatus for the determination of chemical compounds by chemiluminescence with ozone. 4,193,963, Cl. 422-52.000.

Brumm, Richard S., to Cashco, Incorporated. Low torque control valve. 4,193,578, Cl. 251-283.000.

Brundage, Bert W., to Efficiency Systems, Inc. Hotel room status monitor and power control system. 4,194,181, Cl. 340-286.00R.

Brunswick Corporation: *See*—
Gifford, Richard L., 4,193,562, Cl. 242-84.20G.
Stiner, Roy E., 4,193,561, Cl. 242-84.51A.

Brust, David P.: *See*—
Campbell, Gerald A.; Hamilton, Lewis R.; and Brust, David P., 4,193,796, Cl. 430-227.000.

Bubula, Thomas J.; Franz, Maurice F.; Johnson, Gordon W.; and Rinaldo, James D., to Caterpillar Tractor Co. Controls for combined hydrostatic and multiple speed range transmission units with automatic speed control and braking functions. 4,193,323, Cl. 74-733.000.

Buckler, Robert T., to Miles Laboratories, Inc. Diphenylhydantoin derivatives. 4,194,048, Cl. 548-312.000.

Bugamelli, Ralph, to Colt Industries Operating Corp. Carbureting discharge means. 4,193,947, Cl. 261-41.00D.

Buhler, Marcel: *See*—
Hodel, Theodore; Buhler, Marcel; and Rehacek, Josef, 4,194,018, Cl. 426-580.000.

Bula, Karl, to Sulzer Brothers Limited. Suspension system. 4,193,571, Cl. 248-343.000.

Bull, Glen C., J. Non-aerosol type dispenser. 4,193,513, Cl. 222-1.000.

Burgess, Carlton M., to General Motors Corporation. Radiator drain assembly. 4,193,575, Cl. 251-144.000.

Burgos Pty. Limited: *See*—
Van Heel, Theodore; and Van Heel, Henry, 4,193,696, Cl. 366-66.000.

Burke, Dennis J.: *See*—
Dillman, Terry R.; and Burke, Dennis J., 4,193,817, Cl. 127-46.00A.

Burnett, James H. Stop motion and condition responsive apparatus for carding machines. 4,193,168, Cl. 19-0.250.

Burr-Brown Research Corporation: *See*—
Payne, Francis L.; and Godsey, Ernest E., 4,194,147, Cl. 323-17.000.

Burris, Michael V. Gilsonite emulsion compositions. 4,193,815, Cl. 106-202.000.

Burroughs Corporation: *See*—
Bodin, Leslie J., 4,194,197, Cl. 340-711.000.

Bushman, Thomas: *See*—
Miller, Scott; Bushman, Thomas; Kruger, Kurt; and Van Dyck, Kenneth, 4,193,704, Cl. 402-19.000.

Butler, James R., to Fairchild Camera and Instrument Corporation. Input stage using junction field effect transistors for biasing. 4,194,136, Cl. 307-296.00R.

Buxton, Gordon D.; and Buxton, John W. Device for arranging playing elements. 4,193,512, Cl. 221-185.000.
Buxton, John W.: *See*—
Buxton, Gordon D.; and Buxton, John W., 4,193,512, Cl. 221-185.000.
C. D. Sparling Company: *See*—
Guenther, Torbett B., 4,193,586, Cl. 256-69.000.
C. Plath GmbH Nautisch Elektronische Technik: *See*—
Zauscher, Hermann, 4,194,207, Cl. 343-120.000.
Cachia, Joseph M., to Allied Chemical Corporation. Motorized passive seat belt system. 4,193,613, Cl. 280-804.000.
Cadillac Gage Company: *See*—
Jackson, Theodore A., 4,193,334, Cl. 89-41.00E.
Calamari, Timothy A., Jr.: *See*—
Harper, Robert J., Jr.; Calamari, Timothy A., Jr.; and Schreiber, Sidney P., 4,194,032, Cl. 427-341.000.
Calleance, David. Waterbed safety liner. 4,193,151, Cl. 5-452.000.
Calpis Shokuhin Kogyo Kabushiki Kaisha: *See*—
Yasumatsu, Mutsuo; Katayama, Kenji; Takeuchi, Shozo; and Saito, Yoshio, 4,194,019, Cl. 426-580.000.
Calspan Corporation: *See*—
Rich, Joseph W.; and Bergman, Richard C., 4,194,169, Cl. 331-94.50G.
Cameron Iron Works, Inc.: *See*—
Baker, Gerald S.; and Hahn, Guerry L., 4,193,307, Cl. 73-701.000.
Campbell, Bruce D., to Raychem Corporation. Heat recoverable closure with substrate protective means. 4,194,082, Cl. 174-74.00A.
Campbell, Gerald A.; Cohen, Hyman; Hamilton, Lewis R.; and Villard, George, to Eastman Kodak Company. Photographic film units containing a polymeric mordant which covalently bonds with certain dyes. 4,193,795, Cl. 430-213.000.
Campbell, Gerald A.; Hamilton, Lewis R.; and Brust, David P., to Eastman Kodak Company. Polymers for use in image receiving elements for metallizable dyes in image transfer film units. 4,193,796, Cl. 430-227.000.
Campbell, Robert W.: *See*—
Ferm, Richard L.; and Campbell, Robert W., 4,193,809, Cl. 106-97.000.
Campbell Soup Company: *See*—
Early, James R.; and Lobach, Donald C., 4,193,528, Cl. 228-37.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Hara, Elmer H., 4,193,662, Cl. 350-96.150.
Canadian Patents & Development Ltd.: *See*—
Shen, Kuo-Cheng, 4,193,814, Cl. 106-123.0LC.
Canfield, Sheldon A.; and Karch, Walter J., to Owens-Corning Fiberglas Corporation. Batch sensor for glass-melting furnaces. 4,194,077, Cl. 13-6.000.
Cannon, William N., to Eli Lilly and Company. Novel oxiodinium and thiaiodinium compounds. 4,193,935, Cl. 260-505.00R.
Canon Kabushiki Kaisha: *See*—
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; and Sagara, Seiji, 4,193,483, Cl. 192-26.000.
Tanaka, Hiroshi; and Tsuneda, Terukuni, 4,194,020, Cl. 427-16.000.
Tanigawa, Koichi; and Ishihara, Takayuki, 4,193,681, Cl. 355-3.0FU.
Carides, James N.; and Murphy, Donald W., to Bell Telephone Laboratories, Incorporated. Rechargeable dichalcogenide cell. 4,194,062, Cl. 429-194.000.
Carlisle, Denis R.; and Grun, Andrew R., to Rolls-Royce Limited. Combustion apparatus. 4,193,260, Cl. 60-737.000.
Carlson, Alan J., to Metro-Tel Corp. Lineman's hand test set. 4,194,098, Cl. 179-175.000.
Carmichael, Leland E.: *See*—
Appel, Max J. G.; Carmichael, Leland E.; and Scott, Fredric W., 4,193,990, Cl. 424-89.000.
Appel, Max J. G.; and Carmichael, Leland E., 4,193,991, Cl. 424-89.000.
Carrier Corporation: *See*—
Barry, Vincent T., 4,193,269, Cl. 62-171.000.
Sood, Vijay K., 4,193,603, Cl. 277-3.000.
Cashco, Incorporated: *See*—
Brumm, Richard S., 4,193,578, Cl. 251-283.000.
Caspar, Jean-Pierre; and Lelong, Bernard, to Lafarge. Plaster obtained from phosphogypsum and its process of obtention. 4,193,812, Cl. 106-110.000.
Cataldo, Roy S., to General Motors Corporation. Run-flat tire having internal support means. 4,193,436, Cl. 152-158.000.
Caterpillar Tractor Co.: *See*—
Bubula, Thomas J.; Franz, Maurice F.; Johnson, Gordon W.; and Rinaldo, James D., 4,193,323, Cl. 74-733.000.
Cline, Lawrence R., 4,193,587, Cl. 267-170.000.
Simmons, Gerald P., 4,193,467, Cl. 180-271.000.
Caunt, Anthony D.; Vincent, Peter I.; and Newton, Alan B., to Imperial Chemical Industries Limited. Transition metal catalyst. 4,193,893, Cl. 252-429.00B.
Cavallari, Francesco, to E.L.V.I. S.p.A. Apparatus for determining blood elasticity parameters. 4,193,293, Cl. 73-64.100.
Cavazza, Claudio. Therapeutic application of acetyl-d,l-carnitine and other acyl derivatives of d,l-carnitine. 4,194,006, Cl. 424-311.000.
Cederqvist, Gunnar; and Aberg, Ulf, to Rockwool Aktiebolaget. Method for the manufacture of a mineral fiber sheet. 4,193,841, Cl. 162-152.000.
Celanese Corporation: *See*—
Unruh, Jerry D.; and Wells, William J., III, 4,193,943, Cl. 260-604.0HF.
Cerberus AG: *See*—
Meier, Otto; and Scheidweiler, Andreas, 4,194,120, Cl. 250-381.000.
Chalmers, Alexander A.; Gailey, J. Lynn; and Wollam, Carl A., to Alcan Aluminum Corporation. Window casing cover. 4,193,238, Cl. 52-211.000.
Chang, Clarence D., to Mobil Oil Corporation. Residual oil desulfurization in multiple zones without concommitant increase in hydrogen consumption. 4,193,864, Cl. 208-210.000.
Chang, Eng P.; Ilardo, Charles S.; and Slagowski, Eugene L., to Hooker Chemicals & Plastics Corp. Flame retardant nylon compositions. 4,194,072, Cl. 525-432.000.
Chapman, Duane K.: *See*—
Whittington, Lawrence E.; Deviney, Marvin L., Jr.; Lewis, James E.; and Chapman, Duane K., 4,193,900, Cl. 260-28.50B.
Charles, Herbert N., to Fram Corporation. Vibration isolator for flexible bladed fan. 4,193,740, Cl. 416-132.00A.
Charles, James F.: *See*—
United States of America, National Aeronautics and Space Administration; Charles, James F.; and Theakston, Harry A., 4,193,435, Cl. 151-41.760.
Charmley, Richard P.; and Scott, William A., to Walbro Corporation. Mounting structure for plastic carburetors. 4,193,948, Cl. 261-65.000.
Chase, John D.; Woods, Hanbury J.; and Kennedy, Bruce W., to Gulf Canada Limited. Preparation of gasoline containing tertiaryamyl methyl ether. 4,193,770, Cl. 44-56.000.
Chauvier, Daniel Jean Velere Denis: *See*—
Chauvier, Fernand L. O. J., 4,193,156, Cl. 15-1.700.
Chauvier, Fernand L. O. J., to Chauvier, Daniel Jean Velere Denis. Apparatus for cleaning submerged surfaces. 4,193,156, Cl. 15-1.700.
Chemplex Company: *See*—
Pullukat, Thomas J.; Shida, Mitsuzo; and Hoff, Raymond E., 4,194,074, Cl. 526-100.000.
Cheng, William J.; and Guthrie, David B., to Petrolite Corporation. ZnO dispersions by decomposition of $ZnCO_3$. 4,193,769, Cl. 44-51.000.
Cheung, Harry, to Union Carbide Corporation. Porous metal-alumina composite. 4,193,793, Cl. 75-235.000.
Chevron Research Company: *See*—
Adamson, John S., 4,194,177, Cl. 340-152.00T.
Antoniades, Emilios P., 4,194,056, Cl. 562-516.000.
Ferm, Richard L.; and Campbell, Robert W., 4,193,809, Cl. 106-97.000.
Ferm, Richard L., 4,193,810, Cl. 106-97.000.
Ferm, Richard L., 4,193,811, Cl. 106-97.000.
Ferm, Richard L.; and Latif, Chester C., 4,193,816, Cl. 106-277.000.
Steddum, Riddle E.; Ray, Donald R.; and Crager, Bruce L., 4,193,455, Cl. 166-359.000.
Chicago Bridge & Iron Company: *See*—
DeGraaf, Douglas W.; and Tam, William A., 4,193,368, Cl. 114-230.000.
Childs, Everett L.; and Long, Jack L., to United States of America, Energy. Decontaminating metal surfaces. 4,193,853, Cl. 204-129.950.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT: *See*—
Szantay, Csaba; Szabo, Lajos; Toth, Istvan; Kanyo, Erzsebet; Sebestyen, Gyula; and Virag, Sandor, 4,193,998, Cl. 424-258.000.
Chorvat, Robert J., to G. D. Searle & Co. 25-Alkyl-3β-hydroxycholest-5-en-7-ones and esters thereof. 4,193,930, Cl. 260-397.200.
Christensen, Burton G.; Leanza, William J.; and Wildonger, Kenneth J., to Merck & Co., Inc. Substituted N-methylene derivatives of thienamycin. 4,194,047, Cl. 546-272.000.
Christopherson, Warren A., to International Business Machines Corporation. Electronic signal level translating circuitry. 4,194,135, Cl. 307-260.000.
Chromalloy American Corporation: *See*—
Meyers, Peter S., 4,193,868, Cl. 210-35.000.
Chrysler Corporation: *See*—
Lee, John; and Golin, Leo, 4,194,043, Cl. 428-582.000.
Chrysler United Kingdom Limited: *See*—
Hobley, William J.; and Rollason, William I. M., 4,193,631, Cl. 297-408.000.
Chu, Richard C.; Hwang, Un-pah; and Simons, Robert E., to International Business Machines Corporation. Conduction cooled module. 4,193,445, Cl. 165-79.000.
Church & Dwight Co., Inc.: *See*—
Schoenholz, Daniel; Petersen, Arthur W.; and Northup, Marcus A., Jr., 4,193,886, Cl. 252-90.000.
Chvapil, Milos, to Medi-Coll, Inc. Method for making collagen sponge. 4,193,813, Cl. 106-122.000.
Ciba-Geigy Aktiengesellschaft: *See*—
Hopwood, Howard R.; and Trunley, Roy, 4,193,801, Cl. 430-570.000.
Ciba-Geigy Corporation: *See*—
Abeler, Gerd, 4,193,913, Cl. 260-45.75S.
Audykowski, Thaddeus; and Moser, Roland, 4,193,905, Cl. 260-30.60R.
Back, Gerhard; and Fasciati, Alfred, 4,193,916, Cl. 260-146.00R.
Baumann, Marcus; Kvita, Vratislav; Roth, Martin; and Waterhouse, John S., 4,193,927, Cl. 260-326.260.
Cibie Projecteurs: *See*—
Deverrewaere, Alain, 4,193,659, Cl. 339-17.00D.
Cicognani, Mario, to Industrie Pirelli S.p.A. Trapezoidal driving belt. 4,193,312, Cl. 74-231.00C.

Cincinnati Milacron-Heald Corporation: *See—*
Uhtenwoldt, Herbert R., 4,193,227, Cl. 51-165.770.
Cipolli, Roberto; and Boffa, Gioacchino, to Aziende Colori Nazionali Affini Acna S.p.A. Dyeing and printing of water-swellable cellulose material and blends thereof with synthetic fibres, by means of disazo dyes derived from amino-pyrazole. 4,193,763, Cl. 8-21.00C.
Citizen Watch Co., Ltd.: *See—*
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,193,255, Cl. 368-34.000.
Miyashita, Masakazu; and Kanai, Akira, 4,193,644, Cl. 308-9.000.
Clasen, Richard H.: *See—*
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Clason, Stanley E.; and Gilliland, John W., to Corning Glass Works. Dry preparation for reticulocyte staining. 4,193,980, Cl. 424-3.000.
Clavenna, LeRoy R.: *See—*
Sharp, David W.; Clavenna, LeRoy R.; Gorbaty, Martin L.; and Tsou, Joe M., 4,193,771, Cl. 48-197.00R.
Clements, Alwin S.: *See—*
Metcalfe, Kenneth A.; Clements, Alwin S.; and Wilson, Clive W., 4,193,794, Cl. 430-137.000.
Clements, Harold J.; and Ely, Frank, to Modern Precision Engineers & Associates Limited. Presses. 4,193,341, Cl. 100-93.00P.
Clevepak Corporation: *See—*
Dunne, Owen F., 4,193,364, Cl. 112-281.000.
Cline, Lawrence R., to Caterpillar Tractor Co. Recoil spring assembly. 4,193,587, Cl. 267-170.000.
Cline, Oren W. High efficiency heat return fireplace. 4,193,387, Cl. 126-121.000.
Clint, Inc.: *See—*
Marc, Michel, 4,193,324, Cl. 74-750.00B.
Co-Steel International Limited: *See—*
Bowman, Raymond E.; and Greaves, Anthony, 4,193,283, Cl. 72-204.000.
Cobb, Raymond L., to Phillips Petroleum Company. Pyrolysis of N-substituted-1-cyclohexene-1,2-dicarboximides. 4,193,924, Cl. 260-326.00C.
Codama Holding S.A.: *See—*
Fassina, Cassiano, 4,194,030, Cl. 427-286.000.
Codman & Shurtleff, Inc.: *See—*
Walker, Peter S., 4,193,139, Cl. 3-1.910.
Coffen, David, to Hoffmann-La Roche Inc. Lasalocid derivatives. 4,193,928, Cl. 260-345.70R.
Cohen, Abraham B.; and Heiart, Robert B., to Du Pont de Nemours, E. I., and Company. Method for making photoresists. 4,193,797, Cl. 430-258.000.
Cohen, Hyman: *See—*
Campbell, Gerald A.; Cohen, Hyman; Hamilton, Lewis R.; and Villard, George, 4,193,795, Cl. 430-213.000.
Cojan, Yves, to Thomson-CSF. Display collimator system including a standby reticle arrangement. 4,193,666, Cl. 350-174.000.
Colato, Albert E., to Plastics, Inc. Method of cooking a frozen food item with a heat probe. 4,194,015, Cl. 426-233.000.
Colgate-Palmolive Company: *See—*
McHugh, Neil M., 4,193,888, Cl. 252-99.000.
Collier, Samuel A. Rotary hydrostatic coupling. 4,193,484, Cl. 192-60.000.
Colt Industries Operating Corp.: *See—*
Bugamelli, Ralph, 4,193,947, Cl. 261-41.00D.
Comalco Aluminium (Bellbay) Limited: *See—*
Adam, Colin M.; and Bennett, Clive G., 4,193,822, Cl. 148-3.000.
Combustion Engineering, Inc.: *See—*
Blaskowski, Henry J., 4,193,158, Cl. 15-317.000.
Savor, Dennis E.; and Hales, James W., 4,193,735, Cl. 414-744.000.
Cominco Ltd.: *See—*
Sefton, Verner B.; Swinkels, Godefridus M.; Kirby, Charles R.; and Genik-Sas-Berezowsky, Roman M., 4,193,970, Cl. 423-141.000.
Commonwealth of Australia, The: *See—*
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Commonwealth Scientific and Industrial Research Organization: *See—*
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Compact Industries, Inc.: *See—*
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Compagnie Francaise de Raffinage: *See—*
Muller, Alain; Mathey, Francois; and Bensoam, Jean, 4,193,978, Cl. 423-648.00R.
Compagnie Generale des Etablissements Michelin: *See—*
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Compagnie Industrielle des Telecommunications: *See—*
Luder, Jacques, 4,194,092, Cl. 179-84.0VF.
Compagnie International pour l'Informatique: *See—*
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Compagnie Internationale pour l'Informatique: *See—*
Lazzari, Jean P.; and Helle, Michel, 4,194,110, Cl. 235-450.000.
Compur-Electronic Gesellschaft mit beschrankter Haftung: *See—*
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Conchemco, Incorporated: *See—*
Golobay, Gary L., 4,193,318, Cl. 74-489.000.
Condor Manufacturing Inc.: *See—*
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Confer, Daniel C.: *See—*
Confer, Howard F.; and Confer, Daniel C., 4,193,179, Cl. 29-156.50R.
Confer, Howard F.; and Confer, Daniel C., to Condor Manufacturing Inc. Process of manufacturing an article having a groove rolled therein, and an article produced thereby. 4,193,179, Cl. 29-156.50R.
Conklin, Albert H. Leveling plate and method of utilizing same. 4,194,237, Cl. 362-253.000.
Connolly, James D. Slurry screen. 4,193,503, Cl. 209-393.000.
Continental Group, Inc., The: *See—*
Holmes, Edward W., 4,193,530, Cl. 228-263.000.
Cook, William H., to Kemerica, Incorporated. Process for modifying linear polymer resins. 4,193,896, Cl. 260-2.300.
Cooke, Robert S.: *See—*
Baker, Josefina T.; Cooke, Robert S.; and Sifniades, Stylianos, 4,194,038, Cl. 528-182.000.
Cooley, Jack S., to Mead Corporation, The. Collating apparatus. 4,193,490, Cl. 198-451.000.
Cooper, Jerry W.: *See—*
Medford, Richard D.; and Cooper, Jerry W., 4,194,081, Cl. 174-47.000.
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Copal Company Limited: *See—*
Ishiguro, Yasuo; Wakazono, Kenji; and Saito, Toshihisa, 4,193,673, Cl. 354-23.00D.
Copco, Inc.: *See—*
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Cope, Leonard D.: *See—*
Baer, Ralph H.; and Cope, Leonard D., 4,194,198, Cl. 340-724.000.
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Cornell Research Foundation, Inc.: *See—*
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Appel, Max J. G.; and Carmichael, Leland E., 4,193,991, Cl. 424-89.000.
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Cortez, Jose L. Band saw. 4,193,192, Cl. 30-380.000.
Cotreau, Alexander P. Gear box. 4,193,325, Cl. 74-801.000.
Cotton, Worth, Jr.; and Hunter, A. Reese, to Industrial Air, Inc. Air filter construction. 4,193,780, Cl. 55-378.000.
Cotts, Patricia Ann: *See—*
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Coulbourn, Charles B., Jr., to United States of America, Air Force. Broadband waveguide lens antenna and method of fabrication. 4,194,209, Cl. 343-753.000.
Coviello, William L.: *See—*
Borisuck, John F.; Coviello, William L.; and Sheedy, Gary W., 4,193,155, Cl. 12-40.000.
Cox, Nicholas D. Flea composition for animals. 4,193,986, Cl. 424-28.000.
Cox, Russell; Drilling, Joseph C.; and Stanback, Harris I., to Square D Company. Circuit breaker enclosure. 4,194,100, Cl. 200-50.00A.
Crager, Bruce L.: *See—*
Steddum, Riddle E.; Ray, Donald R.; and Crager, Bruce L., 4,193,455, Cl. 166-359.000.
Cranston, Albert W.; and Rowell, William J., to Cranston Machinery Co., Inc. Lifting hook with safety latch. 4,193,627, Cl. 294-82.00R.
Cranston Machinery Co., Inc.: *See—*
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Crawford, John: *See—*
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Crawford, Lynn D.: *See—*
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Crawford, Roger A.; and Hoekje, Howard H., to PPG Industries, Inc. Silica gels and their formation by electrolysis of silicate solutions. 4,193,851, Cl. 204-101.000.
Crist, Ralph P., to United States of America, Navy. Noisemaker beacon. 4,194,246, Cl. 367-1.000.
Crivello, James V., to General Electric Company. Method of making printing plates and printed circuit. 4,193,799, Cl. 430-319.000.
Crook, Roger L., to Martin-Thomas Limited. Tube end fixtures. 4,193,709, Cl. 403-191.000.
Crystaloid Electronics Company: *See—*
Richardson, Kenneth J., 4,193,669, Cl. 350-334.000.
Cucchiara, Philip M. Auxiliary covering for a window. 4,193,235, Cl. 52-202.000.
Cucinella, Salvatore: *See—*
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Cullingford, Christopher V.; and Read, Martin A., to Lucas Industries Limited. Circuit assembly for exhaust emission monitoring. 4,193,965, Cl. 422-95.000.
Cullum, Otis O., to AMF Incorporated. Method of prolonging the life of a tool joint means. 4,194,031, Cl. 427-289.000.
Cumming, James M.; and Saurenman, Donald G. Ion treatment of photographic film. 4,194,232, Cl. 361-213.000.
Cuprinol Limited: *See—*
Hilditch, Edward A., 4,193,993, Cl. 424-141.000.
Curran, William F. Visual tire valve. 4,193,295, Cl. 73-146.800.
Cushman, Donald R.; Pagen, Charles A.; and Schick, John W., to Mobil Oil Corporation. Controlled deposition of asphalt emulsions. 4,194,023, Cl. 427-138.000.

Cushman, Robert H., to Pennwalt Corporation. Method and apparatus for providing simultaneous displays in panoramic radiography. 4,194,121, Cl. 250-439.00P.
Cutters Exchange, Inc.: *See*—
Frederick, Cecil S., 4,193,589, Cl. 270-31.000.
Cziraki, Imre. Cap remover and closure. 4,193,508, Cl. 215-226.000.
D B Industries, Inc.: *See*—
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Dahm, Manfred: *See*—
Baatz, Gunther; Schafer, Walter; and Dahm, Manfred, 4,193,889, Cl. 252-316.000.
Daimler-Benz Aktiengesellschaft: *See*—
Merkle, Josef, 4,193,629, Cl. 296-190.000.
Dalise, David D. Denture. 4,193,194, Cl. 433-177.000.
Dana Corporation: *See*—
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Danford, Glenn S., to Southwest Utilities, Inc. Hazardous voltage protection circuitry. 4,194,230, Cl. 361-1.000.
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Dates, Harold F.; and Nitsche, Joseph E., to Corning Glass Works. Metallized glass-ceramic cooking vessels exhibiting extended service life. 4,194,042, Cl. 428-332.000.
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Dauphine, Thonet C., to Badger Company, Inc., The. Method for production of organic products from kerogen. 4,193,451, Cl. 166-248.000.
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Davies, Glyndwr J.: *See*—
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Davis, Orland L., Jr.; and Moore, Charles E., Jr., to International Telephone and Telegraph Corporation. Key system protective apparatus. 4,194,093, Cl. 179-99.00R.
Davis, Philip E. Jet mixer and method. 4,193,702, Cl. 366-343.000.
Davis, Richard P. B.; Emblem, Harold G.; Shaw, Richard D.; and Shelley, Stanley J., to Zirconal Processes Limited. Module for furnace walls totally wrapped with thermally combustible material. 4,194,036, Cl. 428-74.000.
Davis, Thomas J., to United States of America, America. Precision envelope detector and linear rectifier circuitry. 4,194,240, Cl. 363-126.000.
Dayco Corporation: *See*—
Medford, Richard D.; and Cooper, Jerry W., 4,194,081, Cl. 174-47.000.
de la Bouillerie, Geoffroy, to Societe d'Optique, Precision Electronique et Mecanique-Sopelem. Electrohydraulic servo-valve. 4,193,425, Cl. 137-861.000.
de la Riviere, Francois-Xavier J., to Regie Nationale des Usines Renault. Painting room with recovery arrangement. 4,193,777, Cl. 55-96.000.
de Andrade Bruening, Inai M. R.: *See*—
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Kitchen, Roger M.; and Lister, Frank, 4,193,708, Cl. 403-188.000.
De Carvalho Vianna, Claudio Werneck. Swimming pool steps and water circulating arrangement for swimming pools. 4,193,143, Cl. 4-172.170.
Deere & Company: *See*—
Meinert, Harry M.; and Long, John D., 4,193,458, Cl. 172-328.000.
DeGraaf, Douglas W.; and Tam, William A., to Chicago Bridge & Iron Company. Offshore mooring system for vessel or ship. 4,193,368, Cl. 114-230.000.
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DeLise, Michael F., to Microwave Semiconductor Corp. Method for fabricating ballasted finger electrode. 4,194,174, Cl. 338-308.000.
Demuth, Hans, to Sulzer Brothers Ltd. Loom having an adjustable deflection beam. 4,193,428, Cl. 139-114.000.
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Deschand, Eugene A. Audible and luminous swingable toy. 4,193,222, Cl. 46-52.000.
Deseret Company, The: *See*—
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Desma-Werke GmbH: *See*—
Koch, Freidrich; Ludwig, Ralf; Gunther, Herbert; and Rebers, Gunter, 4,193,701, Cl. 366-159.000.
DeSoto, Inc.: *See*—
Sekmakas, Kazys; and Shah, Raj, 4,193,904, Cl. 260-29.60H.
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Meyer, Walter, 4,193,418, Cl. 137-118.000.
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Devienne, Andre M.; Igea, Gilbert L.; and Bernard, Jean-Pierre L., to Uniroyal. Pneumatic tire inflation and method. 4,193,429, Cl. 141-4.000.
Deviney, Marvin L., Jr.: *See*—
Whittington, Lawrence E.; Deviney, Marvin L., Jr.; Lewis, James E.; and Chapman, Duane K., 4,193,900, Cl. 260-28.50B.
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Dick, Charles B.; Knutson, Curtis L.; Jones, Frederick W.; and Ireland, Richard D., to United States of America, Navy. Method for interconnecting dissimilar metals welding to an explosively bonded bimetallic coupling. 4,193,529, Cl. 228-107.000.
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Diegel, Herbert F. Adjustable width spool. 4,193,560, Cl. 242-71.900.
Dieterich, Dieter, to Bayer Aktiengesellschaft. Modified polyisocyanates containing sulfonic acid ester groups. 4,194,035, Cl. 528-67.000.
Dietrich, Werner; and Hiemesch, Oswald, to Motoren-Werke Mannheim AG. Compression-ignition internal combustion engine. 4,193,379, Cl. 123-32.00C.
Dietz, Richard E.; and Selman, Charles M., to Phillips Petroleum Company. Magnesium reducing agent-hydrocarbylaluminum halide cocatalyst for titanium tetrahalide. 4,194,075, Cl. 526-125.000.
Dietz, Richard E.; and Nowlin, Oscar D., to Phillips Petroleum Company. Washing magnesium reducing agent prepared in absence of complexing diluent. 4,194,076, Cl. 526-125.000.
Dillman, Terry R.; and Burke, Dennis J., to Illinois Water Treatment. Production of bottler's liquid sugar. 4,193,817, Cl. 127-46.00A.
Disdier, Carlos A. Pneumatic rotary actuator. 4,193,337, Cl. 92-31.000.
Dittmann, Larry E.; Koch, Robert M.; Webster, Van K.; and Harris, Edwin T., to AMP Incorporated. Modular telephone plug. 4,193,658, Cl. 339-97.00P.
Diversified Products Corporation: *See*—
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Doi, Toshitada; Iga, Akira; Hamada, Osamu; Hukuda, Jyoji; and Hamada, Yuichiro, to Sony Corporation. Fluid flow control speaker system. 4,194,095, Cl. 179-113.000.
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Dondeyne, Alban; Marchasson, Maurice; Ravez, Paul; and Soubrier, Louis, to Houilleres du Bassin du Nord et du Pas de Calais. Furnace walls which can be used at high temperatures. 4,193,355, Cl. 110-336.000.
Doneaux, Robert G. Nipple and collar retainer. 4,193,588, Cl. 269-47.000.
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Dornier System GmbH: *See—*
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Double A Products Company: *See—*
Loup, Ronald L.; and Gill, Arthur W., 4,194,173, Cl. 335-260.000.

Double E Company, Inc.: *See—*
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Dougados, Roland; Pierrot, Francois; and Wagner, Remy, to Brasseries Kronenbourg. Apparatus for and method of automatically identifying barrels. 4,193,540, Cl. 235-454.000.

Dow Chemical Company, The: *See—*
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Kelly, Robert J.; and Valle-Riestra, J. Frank, 4,193,838, Cl. 162-5.000.
Miller, Dennis P.; and Tamaki, Masahiko, 4,194,068, Cl. 521-107.000.
Trepanier, Donald L.; and Britton, Thomas C., 4,194,000, Cl. 424-270.000.

Dow Corning Corporation: *See—*
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Trombley, Wayne E.; and Seger, Ronald G., 4,193,672, Cl. 351-160.00R.

Dowgul, Ronald W., to United States of America, Navy. Carbon dioxide absorbent cannister with condensate control. 4,193,966, Cl. 422-122.000.

Doyle, William E., to United States of America, Navy. Grid pulsed oscillator and detector. 4,194,202, Cl. 343-7.0PF.

Dozzi, Giovanni; Cucinella, Salvatore; and Mazzei, Alessandro, to Anic S.p.A. Process for the synthesis of mixed polyimino derivatives of aluminum and alkaline earth metals. 4,193,939, Cl. 260-583.00R.

Dresser Industries, Inc.: *See—*
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Drewery, John O., to British Broadcasting Corporation. Noise reduction in electrical signals. 4,194,219, Cl. 358-167.000.

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Dubach, Werner F.; and Kessler, Hansruedi. Liquid dispensing closure having capillary bores. 4,193,519, Cl. 222-111.000.

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Dudley, Alex. Holding apparatus for sharpening chain saws. 4,193,326, Cl. 76-74.000.

Duff, James A., to Magnetic Peripherals Inc. Magnetic disc housing with means to prevent radial disc shift. 4,194,228, Cl. 360-133.000.

Duffield, Robert. Device for adding soap to shower water. 4,193,520, Cl. 222-133.000.

Dumbeck, Robert F., to Rexnord Inc. Armature slip analysis of induction motors with temperature and voltage correction. 4,194,129, Cl. 307-149.000.

Dumbeck, Robert F., to Rexnord Inc. Electric motor with internal wireless load monitor. 4,194,178, Cl. 340-201.00R.

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Dunne, Owen F., to Clevepak Corporation. Needle cooler. 4,193,364, Cl. 112-281.000.

Du Pont de Nemours, E. I., and Company: *See—*
Ballard, Raymond M., 4,193,559, Cl. 242-67.10R.
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Dura Corporation: *See—*
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Durand, Pierre, to Compagnie Generale des Etablissements Michelin. Assembly for an electrochemical device comprising a plate and a support. 4,194,059, Cl. 429-27.000.

Dye, S. Owen, to ACF Industries, Incorporated. Means for increasing choke valve opening rate. 4,193,946, Cl. 261-39.00B.

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Dynamit Nobel Aktiengesellschaft: *See—*
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E-A-R Corporation: *See—*
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E. J. Brooks Company: *See—*
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Cavallari, Francesco, 4,193,293, Cl. 73-64.100.

Eandi, Roger. Handrail assembly for curved staircase. 4,193,585, Cl. 256-65.000.

Early, James R.; and Lobach, Donald C., to Campbell Soup Company. Apparatus for delivery of solder. 4,193,528, Cl. 228-37.000.

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Frank, David S.; and Ponticello, Ignazio S., 4,194,063, Cl. 435-12.000.
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Eaton-Leonard Corporation: *See—*
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Ebbinga, Richard D., to Minnesota Mining and Manufacturing Company. Multitrack recorder including superimposed real time code. 4,194,222, Cl. 360-18.000.

Eberlein, Helmut; Quenzel, Hermann; and Kornberger, Otto, to Mero-Raumstruktur GmbH & Co. Wurzburg. Bolt connections between tubular rods and junctions in three-dimensional frameworks. 4,193,706, Cl. 403-19.000.

Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, to Citizen Watch Co., Ltd. Electronic timepiece with calendar function. 4,193,255, Cl. 368-34.000.

Eckholt, Heinrich, to Hamel GmbH Zwirnmaschinen. Apparatus for waxing a yarn. 4,193,372, Cl. 118-713.000.

Edelbach, Loren C., to Cornelius Company, The. Dispensing machine mixing device and housing therefor. 4,193,522, Cl. 222-145.000.

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Lund, Ernest K., 4,193,360, Cl. 112-79.00R.
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Egle, Wilhelm, to Zeiss-Stiftung, Carl. Electron microscope or the like and method of use. 4,194,116, Cl. 250-311.000.

Egnell, Axel. Level and density-meter. 4,193,303, Cl. 73-438.000.

Egorov, Viktor P.; Ognevsky, Viktor A.; Orlovsky, Anatoly G.; Ostrovsky, Grigory A.; Ryskind, Alexandr M.; Stepin, Anatoly L.; Trofimov, Oleg F.; and Shklyarov, Isaak N. Method for manufacturing steel spring leaves. 4,193,824, Cl. 148-12.400.

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Eickmann, Karl. Radial piston machine with free-floating piston and piston-shoe assemblies. 4,193,336, Cl. 91-488.000.

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Eklund, Walter A. Automobile headlight alarm system. 4,194,175, Cl. 340-52.00D.

Ekstrand, Kjell G., to Transportteknik Gunnar Ekstrand AB. Roller conveyor. 4,193,493, Cl. 198-781.000.

Electro Minerals, Inc.: *See—*
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Elkins, Samuel R., Jr., to Electro Minerals, Inc. Furnace construction and methods of loading and sealing a combustion chamber therein. 4,193,757, Cl. 432-3.000.

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Enders, Edgar; Stendel, Wilhelm; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. N-aryl-N'-(cyclo)-alkyl-thioureas and their use as agents for combating animal pests and plant pests. 4,194,008, Cl. 424-322.000.
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English Electric Valve Company Limited: *See*—
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Engstrom, William J. Post-hole driver. 4,193,459, Cl. 173-43.000.
Entwistle, Ian D., to Shell Oil Company. Herbicidal derivatives of N-alkylpropanamides. 4,193,789, Cl. 71-103.000.
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Epstein, Peter F.; and McGuire, Willis C., to Stauffer Chemical Company. N-(2-fluoro-1,1,2,2-tetrachloroethylthio)-N-phenyl methane sulfonamides and their use in controlling pests. 4,193,933, Cl. 260-453.0RW.
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Erickson, Charles E.; and Neogi, Amar N., to Precision Cosmet Corp. Identifying means for polymeric contact lenses. 4,193,671, Cl. 351-160.00H.
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Evans, Robert F., to Smith International, Inc. Drilling bit fluid-cooled friction bearing. 4,193,463, Cl. 175-337.000.
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Feng, Tom; and Ghosh, Amal K., 4,193,821, Cl. 148-1.500.
Makowski, Henry S.; Lundberg, Robert D.; and Bock, Jan, 4,193,901, Cl. 260-28.50B.
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Fah, Robert, to Sulzer Brothers Limited. Heat exchanger for a high temperature reactor. 4,193,447, Cl. 165-145.000.
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Fairchild Camera and Instrument Corporation: *See*—
Butler, James R., 4,194,136, Cl. 307-296.00R.
Pfeiffer, James W., 4,193,287, Cl. 29-593.000.
Farah Manufacturing Company, Inc.: *See*—
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Farber, Heinrich: *See*—
Muller, Jurgen; Pfeifer, Josef; Rheude, Alfred; Erckel, Rolf; Farber, Heinrich; and Zrenner, Bernhard, 4,193,682, Cl. 355-10.000.
Faris, Ted V.; and French, Sanford W., IV, to Reneau, Raymond W. Power-operated smoking device. 4,193,411, Cl. 131-171.00R.
Farkas, Rudolf; and Moulin, Michel, to Hoffmann-La Roche Inc. Power supply for flash lamp. 4,194,143, Cl. 315-241.00R.
Fasbender, Heinz: *See*—
Ansen, Jakob; Herchenbach, Horst; Wustner, Helmut; and Fasbender, Heinz, 4,193,554, Cl. 241-19.000.
Fasciati, Alfred: *See*—
Back, Gerhard; and Fasciati, Alfred, 4,193,916, Cl. 260-146.00R.
Fasnacht, Adam F. Chain shackle. 4,193,258, Cl. 59-86.000.
Fassina, Cassiano, to Codama Holding S.A. Method for reinforcing fabric by applying a fluid reinforcing material thereto. 4,194,030, Cl. 427-286.000.
Fattori, Lazzaro A.: *See*—
McDermott, Peter; and Fattori, Lazzaro A., 4,193,497, Cl. 206-387.000.
Faville, Warwick S.: *See*—
Marchant, Ian M.; and Faville, Warwick S., 4,193,544, Cl. 238-347.000.
Fekete, Simon O.; and Meyer, Gustavo A., to Amax Inc. Selective nickel and cobalt extraction from aqueous acidic solutions. 4,193,969, Cl. 423-139.000.
Felsing, Larry E., to Braddock, William A. Passive restraining belt for seated vehicle occupant. 4,193,614, Cl. 280-804.000.
Feng, Tom; and Ghosh, Amal K., to Exxon Research & Engineering Co. Fabrication of heterojunction solar cells by improved tin oxide deposition on insulating layer. 4,193,821, Cl. 148-1.500.
Ferm, Morgan H. O.: *See*—
Rosenberg, Ralf H. S.; and Ferm, Morgan H. O., 4,193,141, Cl. 4-1.000.
Ferm, Richard L.; and Campbell, Robert W., to Chevron Research Company. High-strength concrete objects. 4,193,809, Cl. 106-97.000.
Ferm, Richard L., to Chevron Research Company. Concrete composition. 4,193,810, Cl. 106-97.000.
Ferm, Richard L., to Chevron Research Company. Concrete composition. 4,193,811, Cl. 106-97.000.
Ferm, Richard L.; and Latif, Chester C., to Chevron Research Company. Quick-setting bituminous emulsion compositions. 4,193,816, Cl. 106-277.000.
Fernandez, Ramon B.: *See*—
Shepherd, Gary D.; Fernandez, Ramon B.; Kapaun, R. Glenn; and Logan, Charles P., 4,193,252, Cl. 57-351.000.
Ferrari, Albert: *See*—
Rudaz, Albi; and Ferrari, Albert, 4,194,106, Cl. 219-123.000.
Ferrentino, Antonio, to Industrie Pirelli S.p.A. Flow meter. 4,193,301, Cl. 73-207.000.
Fetters, Harry H.: *See*—
Lee, Charles H.; and Fetters, Harry H., 4,193,618, Cl. 292-7.000.
Fetty, Rosabelle: *See*—
Fetty, Warren N.; and Fetty, Rosabelle, 4,193,517, Cl. 222-78.000.
Fetty, Warren N.; and Fetty, Rosabelle, to Wham-O Mfg. Co. Water squirt cane having movable figure as activator. 4,193,517, Cl. 222-78.000.
Fiber Materials, Inc.: *See*—
Moores, Peter R.; and Shoffner, James E., 4,193,828, Cl. 156-148.000.
Field, Geoffrey D. Suspension device. 4,193,705, Cl. 402-46.000.
Field, George F.; and Zally, William J., to Hoffmann-La Roche Inc. 2-[[2-Methyl-1-[2-benzoyl(or benzyl)phenyl]-1H-imidazol-5-yl]methyl]-1H-isoindole-1,3(2H)-diones. 4,194,049, Cl. 548-336.000.
Filippov, Iosif F.: *See*—
Vinokurov, Alexandr A.; Gorbunov, Gennady S.; Popov, Jury S.; Skachkov, Jury V.; Filippov, Iosif F.; and Khutoretsky, Gary M., 4,194,137, Cl. 310-52.000.
Finlayson, Claude M., to N L Industries, Inc. Viscosity increasing additive for printing inks. 4,193,806, Cl. 106-20.000.
Finn, Melvin. Receptacle for bulk collection of waste paper and the like. 4,193,340, Cl. 100-34.000.
Finnegan, William G.: *See*—
Adicoff, Arnold; Finnegan, William G.; McBride, William R.; and Ayres, William M., 4,193,952, Cl. 264-3.00B.
Fipke, Charles E. Particulate mineral separation process. 4,193,767, Cl. 23-230.0EP.
Fischer, Edwin L. Cantilevered lifting and transporting device. 4,193,147, Cl. 5-81.00R.
Fischer, Klaus; Flauger, Helmut; Balzer, Kurt; and Fischer, Roland, to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH. Vacuum pump assembly with built-in shutoff valve. 4,193,742, Cl. 417-295.000.
Fischer, Roland: *See*—
Fischer, Klaus; Flauger, Helmut; Balzer, Kurt; and Fischer, Roland, 4,193,742, Cl. 417-295.000.
Fischer, Winfried: *See*—
Wingler, Frank; Eichner, Theobald; Muller, Friedemann; Fischer, Winfried; and Prinz, Richard, 4,193,897, Cl. 260-17.00R.
Fisher, Ernest P., Jr., to Otis Engineering Corporation. Surface controlled subsurface safety valve. 4,193,450, Cl. 166-155.000.
Fisk, Harold E. Trailer hitch adapter. 4,193,611, Cl. 280-415.00A.
Fitzgerald, John D., to Bell Telephone Laboratories, Incorporated. Electrical connector assembly apparatus. 4,193,177, Cl. 29-56.600.
Fjarlie, Earl J., to RCA Corporation. Spectrometer. 4,193,691, Cl. 356-330.000.
Flaherty, John J.; and Strauts, Eric J., to Magnaflux Corporation. Ultrasonic testing system. 4,193,306, Cl. 73-629.000.

Flauger, Helmut: *See*—
Fischer, Klaus; Flauger, Helmut; Balzer, Kurt; and Fischer, Roland, 4,193,742, Cl. 417-295.000.
Fleming, Joseph: *See*—
Boyd, Robert L.; Hamilton, David C.; Wood, Wilmer E.; Fleming, Joseph; and Wegmann, Raymond, 4,193,444, Cl. 165-76.000.
Fleming, Thomas W. Dispensing device with two-way flow characteristic and half twist closure. 4,193,524, Cl. 222-484.000.
FMC Corporation: *See*—
Lochte, Glen E.; and Milberger, Lionel J., 4,193,449, Cl. 166-72.000.
Fochesato, Antonio. Noninflammable olefin fiber and method of producing same. 4,193,911, Cl. 260-45.70P.
Focke & Co.: *See*—
Focke, Heinz; and Liedtke, Kurt, 4,193,534, Cl. 229-44.0CB.
Focke, Heinz; and Liedtke, Kurt, to Focke & Co. Foldable blanks and strips for the production of flip-top cigarette boxes. 4,193,534, Cl. 229-44.0CB.
Folser, George R., to United States of America, Energy. Liquid-permeable electrode. 4,193,860, Cl. 204-284.000.
Fondermann & Co.: *See*—
Laibach, Friedrich; and Hoebink, Paul, 4,193,133, Cl. 2-10.000.
Fontaine, Gerard, to Laboratories Cellorgan S.A. Process for the preparation of defibrinated and lyophilized placental cells. 4,193,992, Cl. 424-105.000.
Food Processes, Inc.: *See*—
Peterson, Don G.; and Harper, Judson M., 4,193,758, Cl. 432-27.000.
Ford Motor Company: *See*—
MacKenzie, Ronald, 4,194,119, Cl. 250-352.000.
Springer, Jerry L.; Wells, Charles M.; and Green, Wells L., 4,193,289, Cl. 73-27.00R.
Forslund, Lennart; Jordinger, Stig; and Kolavcic, Pavel, to ASEA Aktiebolag. Magnetoelastic transducer with linear and temperature-independent characteristic. 4,193,294, Cl. 73-141.00A.
Forster, Heinz; Klusacek, Hans; and Wenz, Arthur, to Bayer Aktiengesellschaft. Preparation of substituted fluorobenzenes. 4,194,054, Cl. 562-493.000.
Forsythe, Marlene L.; Laughlin, Amelia; and Laughlin, Wayne. Concealed device for removing animal droppings. 4,193,623, Cl. 294-1.0BB.
Forward, Geoffrey C.; and Gawthorpe, Janet A., nee Baylis, to Beecham Group Limited. Oral hygiene compositions. 4,193,988, Cl. 424-52.000.
Fox, Gordon J.: *See*—
Blatt, John A.; and Fox, Gordon J., 4,193,731, Cl. 414-589.000.
Fram Corporation: *See*—
Charles, Herbert N., 4,193,740, Cl. 416-132.00A.
Frame, Wayne W., to Ball Corporation. Leakage current compensating circuit for semiconductor image sensor. 4,194,220, Cl. 358-221.000.
Francis, Martin H.: *See*—
Bowman, Rodney V.; and Francis, Martin H., 4,193,539, Cl. 235-92.0NG.
Frandsen, Warren E., to T & F Industries, Inc. Apparatus for carrying flexible goods. 4,193,313, Cl. 74-231.00P.
Frangatos, Gerassimos, to Mobil Oil Corporation. Lubricant compositions. 4,193,883, Cl. 252-49.900.
Frank, David S.; and Ponticello, Ignazio S., to Eastman Kodak Company. Method, composition and elements for the detecting of nitrogen-containing compounds. 4,194,063, Cl. 435-12.000.
Frank, Patricia; Kraychy, Stephen; and LeVon, Ernest F., to G. D. Searle & Co. Sodium 3-[[[2-(2-methyl-5-nitro-1H-imidazol-1-yl)ethyl]-amino]carbonyl]-2-pyridinecarboxylic acid and related compounds labeled with technetium-99m. 4,193,979, Cl. 424-1.500.
Franklin Distributors Corporation: *See*—
Mermelstein, Leon, 4,193,218, Cl. 40-374.000.
Franz, Maurice F.: *See*—
Bubula, Thomas J.; Franz, Maurice F.; Johnson, Gordon W.; and Rinaldo, James D., 4,193,323, Cl. 74-733.000.
Fratelli Novello S.p.A.: *See*—
Novello, Renzo; and Bottussi, Elvio, 4,193,723, Cl. 409-122.000.
Frederick, Cecil S., to Cutters Exchange, Inc. Turntable for cloth spreading machine. 4,193,589, Cl. 270-31.000.
Fredman, Harry; and Fredman, Irving N. Bunk bed ladder bracket. 4,193,146, Cl. 5-8.000.
Fredman, Irving N.: *See*—
Fredman, Harry; and Fredman, Irving N., 4,193,146, Cl. 5-8.000.
Freeman, Carl D.; and Grover, Melvin G., to Logan Farm Equipment Co., Inc. Seed planting machine having specific seed guiding structure. 4,193,357, Cl. 111-34.000.
Freese, Jens. Video game system. 4,193,598, Cl. 273-313.000.
French, Sanford W., IV: *See*—
Faris, Ted V.; and French, Sanford W., IV, 4,193,411, Cl. 131-171.00R.
Frenzel, Herbert K.: *See*—
Wahrendorf, York A.; Frenzel, Herbert K.; Ambrosch, Adolf K.; Rasmussen, Knud A.; Seibert, Horst; and Dieckmann, Horst J., 4,193,718, Cl. 405-286.000.
Fritz Gegauf Aktiengesellschaft, Bernina-Nahmaschienfabrik: *See*—
Glaser, Fritz, 4,193,362, Cl. 112-275.000.
Frutschi, Hansulrich, to BBC Brown Boveri & Company Limited. Gas turbine power plant. 4,193,266, Cl. 60-644.000.
Fuji Photo Film Co., Ltd.: *See*—
Ikenoue, Shinpei; and Masuda, Takao, 4,193,804, Cl. 430-353.000.
Mukunoki, Yasuo; Naito, Hideki; and Mitsui, Akio, 4,193,802, Cl. 430-139.000.
Oono, Hiroshi; and Shiozawa, Etuo, 4,193,317, Cl. 74-479.000.
Fujii, Toshihiro; and Yokota, Sekiji, to Hayakawa Rubber Company Limited. Water proofing compositions for cement mortar or concrete and method employing same. 4,193,831, Cl. 156-309.000.
Fujino, Shoji, to Shirota Electric Furnace Material Co., Ltd. Endodontic therapy instrument. 4,193,408, Cl. 128-734.000.
Fujita, Tomikazu: *See*—
Katsumata, Mitsuo; Sato, Hiroo; Ikeda, Yoshihiko; and Fujita, Tomikazu, 4,193,385, Cl. 123-198.0DC.
Fujitsu Limited: *See*—
Tsuda, Toshitaka, 4,194,243, Cl. 364-200.000.
Fukuma, Yositaka, to Sharp Kabushiki Kaisha. Cashier identifying administration in an electronic cash register. 4,194,176, Cl. 340-147.00R.
Fulks, Robert G.; Enfield, Robert E.; and Sacher, Eric, to NCR Corporation. Method and apparatus for isolating faults in a logic circuit. 4,194,113, Cl. 371-20.000.
Furst, Andor; Labler, Ludwig; and Meier, Werner, to Hoffmann-La Roche Inc. Pregnane derivatives. 4,193,921, Cl. 260-239.55R.
Furukawa, Shunsuke: *See*—
Kano, Yasuo; Furukawa, Shunsuke; and Mifune, Tadayoshi, 4,194,213, Cl. 357-24.000.
Furumi, Kihachiro: *See*—
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Fusaroli, Goffredo, to S.A.M.P.R.E. S.p.A. Tensioning device for a drive belt for controlling the rotation of aligned members such as spindles of textile machines. 4,193,254, Cl. 57-105.000.
Futterer, Bodo, to Interelectric AG. Method of manufacturing a stator for an electrical machine. 4,193,184, Cl. 29-596.000.
G. D. Searle & Co.: *See*—
Adelstein, Gilbert W., 4,194,045, Cl. 546-209.000.
Chorvat, Robert J., 4,193,930, Cl. 260-397.200.
Frank, Patricia; Kraychy, Stephen; and LeVon, Ernest F., 4,193,979, Cl. 424-1.500.
G. W. Dahl Company, Inc.: *See*—
Slawson, Richard S., 4,193,416, Cl. 137-75.000.
Gachon, Michel: *See*—
Boigegrain, Robert; Gachon, Michel; Maffrand, Jean-Pierre; and Maire, Gerard, 4,193,997, Cl. 424-256.000.
Gagin, William P.: *See*—
Merkel, Daniel A.; Viglietti, John E.; and Gagin, William P., 4,193,195, Cl. 433-13.000.
Gailey, J. Lynn: *See*—
Chalmers, Alexander A.; Gailey, J. Lynn; and Wollam, Carl A., 4,193,238, Cl. 52-211.000.
Gajdacsi, Andras: *See*—
Agocs, Pal; Fabian, Istvan; Gajdacsi, Andras; Nagy, Sandor; and Pinter, Zoltan, 4,193,922, Cl. 548-132.000.
Galishnikov, Boris M.: *See*—
Berber, Viktor A.; Pervushin, Evgeny S.; Murtazin, Khafiz M.; Kholin, Vladimir G.; and Galishnikov, Boris M., 4,193,288, Cl. 73-1.00R.
Garcia, Moises R., to United States of America, Army. Vehicle control arm spreader tool. 4,193,286, Cl. 72-462.000.
Gardner, Howard S.: *See*—
Nutley, Hugh; and Gardner, Howard S., 4,194,124, Cl. 250-492.00R.
Gargiulo, Antonio. Music-box casing. 4,193,648, Cl. 312-9.000.
Garon Processing Co.: *See*—
Gross, Gary; and Thies, James F., 4,193,145, Cl. 4-346.000.
Gartner, Veit. Device for rupturing a frangible partition between separate chambers in a container. 4,193,698, Cl. 366-130.000.
Gastmeier, William J.: *See*—
Guess, Joe F.; and Gastmeier, William J., 4,193,647, Cl. 310-324.000.
Gathings, David L. Adjustable measuring guide attachment for a picture frame mitering apparatus. 4,193,331, Cl. 83-468.000.
Gawthorpe, Janet A., nee Baylis: *See*—
Forward, Geoffrey C.; and Gawthorpe, Janet A., nee Baylis, 4,193,988, Cl. 424-52.000.
Gebr. Hofmann, G.m.b.H. & Co. KG, Maschinenfabrik: *See*—
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Gebruder Buhler AG: *See*—
Ruegger, Edgar, 4,193,555, Cl. 241-37.000.
Gebrueder Buehler AG: *See*—
Wyss, Franz J.; and Hug, Peter, 4,193,837, Cl. 159-6.00W.
Geissler, Udo M., to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH. Simultaneous multi directional single source multiple reflector electronic photo flash unit. 4,194,234, Cl. 362-17.000.
Gemmill, Robert M., Jr., to Mobil Oil Corporation. Corrosion inhibited lubricant composition. 4,193,882, Cl. 252-47.500.
General Atomic Company: *See*—
Adams, Charles C.; Allen, Curtis L.; and Besenbruch, Gottfried E. A., 4,194,027, Cl. 427-249.000.
Noren, Robert C.; and Spritzer, Michael H., 4,194,079, Cl. 13-25.000.
General Electric Company: *See*—
Albinger, Harry, Jr., 4,194,192, Cl. 340-517.000.
Baum, John W., 4,193,488, Cl. 194-9.00T.
Bochan, John, 4,193,275, Cl. 68-134.000.
Crivello, James V., 4,193,799, Cl. 430-319.000.
Gregersen, Jens O.; and Sorensen, Sigurd B., 4,194,151, Cl. 455-76.000.
Klein, Keith W., 4,194,231, Cl. 361-45.000.

Landis, Delmer H., Jr.; Thomas, Theodore T., Jr.; and Haap, Charles J., 4,193,738, Cl. 415-115.000.
Salem, Robert J., 4,194,191, Cl. 340-515.000.
Slusarczuk, George M. J.; and Brooks, Ronald E., 4,193,866, Cl. 210-6.000.
Tassie, Douglas P., 4,193,335, Cl. 89-7.000.

General Motors Corporation: *See—*
Burgess, Carlton M., 4,193,575, Cl. 251-144.000.
Cataldo, Roy S., 4,193,436, Cl. 152-158.000.
Horner, Thomas G.; and Ellis, Robert A., 4,193,314, Cl. 74-242.500.
Lee, Charles H.; and Fetters, Harry H., 4,193,618, Cl. 292-7.000.
Rogers, David W., 4,193,383, Cl. 123-136.000.
Wunderlich, Langley H., 4,193,481, Cl. 188-71.800.

Genik-Sas-Berezowsky, Roman M.: *See—*
Sefton, Verner B.; Swinkels, Godefridus M.; Kirby, Charles R.; and Genik-Sas-Berezowsky, Roman M., 4,193,970, Cl. 423-141.000.

geobra Brandstaetter GmbH & Co., KG: *See—*
Beck, Hans, 4,193,221, Cl. 46-19.000.

Gerard, William A., to United States of America, Navy. Mode control apparatus for a separable-insert coaxial magnetron. 4,194,142, Cl. 315-39.770.

Gerritsen, Leendert A.; and Scholten, Joseph J. F., to Stamicarbon, B.V. Process for catalytic conversion of olefinically unsaturated compounds with hydrogen and/or carbon monoxide. 4,193,942, Cl. 260-604.0HF.

Gerteis, Hans, to Heinkel Industriezentrifugen GmbH & Co., Firma. Filter centrifuge. 4,193,874, Cl. 210-232.000.

Ghosh, Amal K.: *See—*
Feng, Tom; and Ghosh, Amal K., 4,193,821, Cl. 148-1.500.

Giddings, Brandford E.; Wardlow, Eddie, Jr.; and Mehosky, Brian L., to Standard Oil Company. Rapid removal of residual monomers from acrylonitrile copolymers. 4,193,903, Cl. 260-29.60R.

Gifford, Richard L., to Brunswick Corporation. Anti-reverse device for fishing reel. 4,193,562, Cl. 242-84.20G.

Giglia, Robert D.; and Clasen, Richard H., to American Cyanamid Company. Electrochromic devices having protective interlayers. 4,193,670, Cl. 350-357.000.

Gilbert, Bruce. Perforating gun with paired shaped charger vertically spaced. 4,193,460, Cl. 175-4.600.

Giles, William E. Motor vehicle ventilation device. 4,193,339, Cl. 98-2.140.

Gill, Arthur W.: *See—*
Loup, Ronald L.; and Gill, Arthur W., 4,194,173, Cl. 335-260.000.

Gill, Gerald L., Jr.; and Rioux, Philip J., to Kayex Corporation. Polishing apparatus. 4,193,226, Cl. 51-124.00R.

Gilleman, Joseph T. G., to Sperry Rand Corporation. Vehicle protective system. 4,193,248, Cl. 56-10.200.

Gillery, Frank H., to PPG Industries, Inc. Transparent, colorless, electrically conductive coating. 4,194,022, Cl. 427-109.000.

Gillespie, Ronald G., to Texaco Development Corporation. Floating point amplifier means and method. 4,194,163, Cl. 330-86.000.

Gilliland, John W.: *See—*
Clason, Stanley E.; and Gilliland, John W., 4,193,980, Cl. 424-3.000.

Gilpin, Jo Ann: *See—*
Briggs, Roger A.; and Gilpin, Jo Ann, 4,193,919, Cl. 260-239.30P.

Girling Limited: *See—*
Knight, Frederick J., 4,193,643, Cl. 303-118.000.

Giussani, Franco. Door latch. 4,193,620, Cl. 292-169.170.

Gjerde, Trygve, to A/S Hoyer-Ellefsen; Ing. T. Furuholmen; and Ing. F. Selmer A/S. Method for erecting a deck on a marine structure. 4,193,714, Cl. 405-204.000.

Glacier Metal Company, Limited: *See—*
Baker, Dennis S.; and Davies, Glyndwr J., 4,193,645, Cl. 308-23.000.

Gladstone, Joseph, to Beatrice Foods Co. Arm/rotor hub assembly. 4,193,549, Cl. 239-251.000.

Glaser, Fritz, to Fritz Gegauf Aktiengesellschaft, Bernina-Nahmaschienfabrik. Device for locking the needle bar of a sewing machine in one of its end positions. 4,193,362, Cl. 112-275.000.

Glaxo Laboratories, Limited: *See—*
Barton, Derek H. R.; Long, Alan G.; Looker, Brian E.; Wilson, Edward M.; and Elphinstone, William G., 4,193,917, Cl. 260-239.00A.

Glendinning, William B., to United States of America, Army. Analog-to-digital conversion by charge coupled device. 4,194,187, Cl. 340-347.0AD.

Godsey, Ernest E.: *See—*
Payne, Francis L.; and Godsey, Ernest E., 4,194,147, Cl. 323-17.000.

Goeke, George L.; and Karol, Frederick J., to Union Carbide Corporation. Process for preparing olefin oxide polymerization catalysts by aging the catalysts. 4,193,892, Cl. 252-428.000.

Goelz, David W.: *See—*
Hetherington, Robert D.; and Goelz, David W., 4,193,546, Cl. 239-112.000.

Golden, Jeffry: *See—*
Pasour, John A.; Kapetanakos, Christos A.; Mahaffey, Redge A.; and Golden, Jeffry, 4,194,139, Cl. 313-153.000.

Goldie, Harry, to United States of America, Air Force. Combined receiver protector, AGC attenuator and sensitivity time control device. 4,194,200, Cl. 343-5.0SM.

Goldstein, Theodore P., to Mobil Oil Corporation. Super-active clay catalyst and use thereof. 4,193,454, Cl. 166-302.000.

Golin, Leo: *See—*
Lee, John; and Golin, Leo, 4,194,043, Cl. 428-582.000.

Golinkin, Herbert S., to Standard Oil Company (Indiana). Method for consolidating sand or water control in subterranean formations. 4,193,453, Cl. 166-295.000.

Golobay, Gary L., to Conchemco, Incorporated. Brake lever. 4,193,318, Cl. 74-489.000.

Gomberg, Moris L.: *See—*
Pankratov, Vladimir I.; Konovalenko, Gennady P.; Prilipko, Ivan T.; and Gomberg, Moris L., 4,194,114, Cl. 250-308.000.

Good, Thomas W.: *See—*
Pauly, Ronald R.; Good, Thomas W.; Hastings, John D.; and Ryan, Kevin D., 4,193,639, Cl. 301-9.0DH.

Goodale, Clark W.; Morgan, Charles W.; Rhoton, Albert L.; and McNeil, David F., to United Foam Corporation. Method of manufacturing textured foam coatings and materials. 4,194,026, Cl. 427-244.000.

Goodin, Raymon L. Pool cleaning system and apparatus. 4,193,870, Cl. 210-65.000.

Gorbaty, Martin L.: *See—*
Sharp, David W.; Clavenna, LeRoy R.; Gorbaty, Martin L.; and Tsou, Joe M., 4,193,771, Cl. 48-197.00R.

Gorbunov, Gennady S.: *See—*
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Gore, Robert W.; and Allen, Samuel B., Jr., to W. L. Gore & Associates, Inc. Waterproof laminate. 4,194,041, Cl. 428-315.000.

Gostelow, Daniel W. F., to Wildt Mellor Bromley Limited. Yarn feed and change mechanisms. 4,193,274, Cl. 66-140.00R.

Goto, Takayuki: *See—*
Saito, Tadao; Nozawa, Takamitsu; Tsuchida, Haruo; Iizuka, Shigeo; and Goto, Takayuki, 4,193,551, Cl. 239-333.000.

Goudie, Alexander C., to Beecham Group Limited. Pharmacologically active enol ether compounds. 4,194,010, Cl. 424-341.000.

Gould, Inc.: *See—*
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Grabmaier, Josef: *See—*
Aulich, Hubert; Grabmaier, Josef; and Eisenrith, Karl-Heinz, 4,193,782, Cl. 65-11.00R.

Graf, Dieter. Vehicle attachment for increasing adhesion to the supporting surface by suction force. 4,193,469, Cl. 180-164.000.

Grapes, Robert D.; and Watson, Donald J., to Magnetic Peripherals Inc. Disk indicator and ejector. 4,194,224, Cl. 360-97.000.

Gray, James A.; and Lindfors, Randall V., to Zero-Max Industries, Inc. Adjustable shelf device. 4,193,650, Cl. 312-205.000.

Greaves, Anthony: *See—*
Bowman, Raymond E.; and Greaves, Anthony, 4,193,283, Cl. 72-204.000.

Green, John F., to Compact Industries, Inc. Cup and package of cups. 4,193,494, Cl. 206-217.000.

Green, Wells L.: *See—*
Springer, Jerry L.; Wells, Charles M.; and Green, Wells L., 4,193,289, Cl. 73-27.00R.

Greenhalgh, Peter F.: *See—*
Hildon, Anthony M.; and Greenhalgh, Peter F., 4,193,929, Cl. 260-348.250.

Gregersen, Jens O.; and Sorensen, Sigurd B., to General Electric Company. Multifrequency generator. 4,194,151, Cl. 455-76.000.

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Rinio, Johannes A.; and Tanson, Rodolphe F., 4,193,311, Cl. 74-230.500.

Greis, Ingemar; and Ingesson, Lars-Olof, to Stal-Laval Apparat AB. Intermediate steam superheater. 4,193,446, Cl. 165-108.000.

Griffith, Harold J., to Alton Box Board Company. Bulk materials container formed from substantially rectangular blank. 4,193,535, Cl. 229-52.00B.

Gross, Gary; and Thies, James F., to Garon Processing Co. Toilet flushing valve mechanism. 4,193,145, Cl. 4-346.000.

Gross, Valery N. Arrangement for continuously measuring the radioactivity of solutions of matters in a homogeneous mixture with a liquid scintillator. 4,194,117, Cl. 250-328.000.

Grover, Melvin G.: *See—*
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Gruber, William A. Removable cast for intermediate phase orthopedic rehabilitation. 4,193,395, Cl. 128-90.000.

Grun, Andrew R.: *See—*
Carlisle, Denis R.; and Grun, Andrew R., 4,193,260, Cl. 60-737.000.

Guarnaschelli, Vincent; and Reiss, Mitchell, to R & G Energy Research Corporation. Liquid to gas fuel conversion burner device. 4,193,755, Cl. 431-207.000.

Guenther, Torbett B., to C. D. Sparling Company. Hand rail. 4,193,586, Cl. 256-69.000.

Guess, Joe F.; and Gastmeier, William J., to Telex Communications, Inc. Piezoelectric ceramic transducers with uniform resonant frequency. 4,193,647, Cl. 310-324.000.

Gulf Canada Limited: *See—*
Chase, John D.; Woods, Hanbury J.; and Kennedy, Bruce W., 4,193,770, Cl. 44-56.000.

Gunderson, Arthur S. Combination wagon and sled. 4,193,608, Cl. 280-8.000.

Gunther, Herbert: *See—*
Koch, Freidrich; Ludwig, Ralf; Gunther, Herbert; and Rebers, Gunter, 4,193,701, Cl. 366-159.000.

Gurien, Harvey; and Teitel, Sidney, to Hoffmann-La Roche Inc. Tetrahydro 2-carbazolyl methyl malonate derivatives. 4,193,923, Cl. 260-315.000.

Guthrie, David B.: *See*—
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Haap, Charles J.: *See*—
Landis, Delmer H., Jr.; Thomas, Theodore T., Jr.; and Haap, Charles J., 4,193,738, Cl. 415-115.000.
Haarmann & Reimer GmbH: *See*—
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Hachino, Hiroaki: *See*—
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Hahn, Guerry L.: *See*—
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Hales, James W.: *See*—
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Hall & Myers: *See*—
Rabinow, Jacob, 4,194,126, Cl. 250-566.000.
Halleck, Frank E.: *See*—
Young, Jack H.; Karle, David A.; and Halleck, Frank E., 4,193,818, Cl. 134-1.000.
Haller, Jacob S.; Mines, Gordon L.; and Mischnick, Meinert J., to TRW, Inc. Clamp-squeezing apparatus. 4,193,187, Cl. 29-749.000.
Hallock, Robert L. Non-slotted clinch type nail. 4,193,333, Cl. 85-31.000.
Halm, Roland L., to Dow Corning Corporation. Method for preparing a thermal-stability additive and a thermally stabilized methylpolysiloxane and compositions therefrom. 4,193,885, Cl. 252-78.300.
Halverson, Henry J., to Olin Corporation. Projectile for centerfire pistol and revolver cartridges. 4,193,348, Cl. 102-91.000.
Hamada, Osamu: *See*—
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Hamada, Yuichiro: *See*—
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Hamaguchi, Hiroshi; and Kawano, Tadaaki, to Sharp Kabushiki Kaisha. Developer powder supply in magnet brush development. 4,193,376, Cl. 118-658.000.
Hamano, Eizaburo; and Komatsu, Tetsuo, to Tokyo Shibaura Electric Co., Ltd. Beam-indexing color image-presentation cathode ray tube. 4,194,140, Cl. 313-471.000.
Hamburger, Nancy Fern: *See*—
Robbins, Robert, 4,194,242, Cl. 364-200.000.
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Hamilton, Lewis R.: *See*—
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Campbell, Gerald A.; Hamilton, Lewis R.; and Brust, David P., 4,193,796, Cl. 430-227.000.
Hamilton, William M.; Scholl, Charles H.; Kruke, Jeffrey J.; and Akers, Larry D., to Nordson Corporation. Gear pump with means for dispersing gas into liquid. 4,193,745, Cl. 418-9.000.
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Sirrenberg, Wilhelm; Klauke, Erich; Schramm, Jurgen; Hammann, Ingeborg; and Stendel, Wilhelm, 4,194,005, Cl. 424-304.000.
Hammond, Theodore A. Line shaft drive for powered roller conveyor. 4,193,492, Cl. 198-781.000.
Hanrahan, James R.; and Levine, Richard G., to Bristol-Myers Company. Protective device with integrally molded pad. 4,193,134, Cl. 2-16.000.
Hanson, Harold W., Jr.; and Doering, Beuford C., to Par-Way Co. Spray apparatus for applying ingredient coatings to food products. 4,193,373, Cl. 118-17.000.
Hara, Elmer H., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Broadband switching system utilizing optical fiber waveguides. 4,193,662, Cl. 350-96.150.
Harden, Richard L. Feeder for hay bales and stacks. 4,193,378, Cl. 119-60.000.
Harder, Ulli: *See*—
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Peterson, Don G.; and Harper, Judson M., 4,193,758, Cl. 432-27.000.
Harper, Robert J., Jr.; Calamari, Timothy A., Jr.; and Schreiber, Sidney P., to United States of America, Agriculture. Transfer techniques for producing flame retardant cotton fabrics. 4,194,032, Cl. 427-341.000.
Harris Corporation: *See*—
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Harris, Edwin T.: *See*—
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Hartemann, Pierre, to Thomson-CSF. Refractive stigmatic system for elastic surface waves. 4,193,473, Cl. 181-176.000.
Harth, Helmut; and Becker, Dieter, to Blendax-Werke R. Schneider GmbH & Co. Non-corrosive toothpaste. 4,193,987, Cl. 424-49.000.
Hartman, Arlin P., to American Seating Company. Handrail for telescoping seating system with removable rails. 4,193,229, Cl. 52-9.000.
Hartmann, John C.; and Maxemchuk, Nicholas F., to RCA Corporation. Bidirectional digital position encoder. 4,194,184, Cl. 340-347.00P.
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Hasegawa, Kiyoshi, to Kabushiki Kaisha Kantool. Inspection apparatus for underground channels. 4,194,218, Cl. 358-100.000.
Hasegawa, Mitsuru: *See*—
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Hashimoto, Nobuyuki: *See*—
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Hasler, Alfred, to International Memories, Inc. Housing for disk drive unit. 4,194,225, Cl. 360-98.000.
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Hatanaka, Akio, to Sakura Color Products Corporation. Compositions for solid writing materials and writing implements. 4,193,906, Cl. 260-31.20R.
Hatten, Maurice E. Solar heating system. 4,193,390, Cl. 126-429.000.
Hattori, Hironori: *See*—
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Hauni-Werke Korber & Co. Kg.: *See*—
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Hayakawa, Yoshikazu: *See*—
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Haygeman, Drew O.; and Haygeman, Robert M. Washer and carrier for elongated objects. 4,193,699, Cl. 366-130.000.
Haygeman, Robert M.: *See*—
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Hays, Bill J. Ignition wire improvements. 4,193,651, Cl. 339-28.000.
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Hazama, Motoo, to Sumitomo Chemical Company, Limited. Process for producing an enamide. 4,194,050, Cl. 560-41.000.
Heck, Rudolf N., to Meadox Medicals, Inc. Warp-knitted double-velour prosthesis. 4,193,137, Cl. 3-1.400.
Heckelsberg, Robert E., to AMCA International Corporation. Panel mounting clip. 4,193,247, Cl. 52-713.000.
Heckenhauer, William G., to Dresser Industries, Inc. Multiple tip cutting bit for rotary drum-type cutter. 4,193,638, Cl. 299-89.000.
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Heim, Ernst; Imbery, Dieter; and Kliemann, Bruno, to Rhodia AG. Additive for smoking tobacco products, filter elements thereof and process for the preparation thereof. 4,193,412, Cl. 131-264.000.
Heinkel Industriezentrifugen GmbH & Co., Firma: *See*—
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Heinlein, Werner, to Robert Bosch GmbH. Automatic headlight tilting device for automobiles. 4,194,235, Cl. 362-38.000.
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Held, Kurt. Sliding surface seal on continuous laminating machines. 4,193,342, Cl. 100-154.000.
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Hemscheidt, Egbert: *See*—
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Hencke, Dietmar, to LTG Lufttechnische GmbH. Air filtering apparatus. 4,193,779, Cl. 55-290.000.
Hengartner, Urs; Reymond, Gilbert; and Toome, Valdemar, to Hoffmann-La Roche Inc. Alkanoyloxylation of beta-ionone. 4,193,850, Cl. 204-79.000.
Henning, Hans J.: *See*—
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Henningfield, Bernadine. Child's toilet apparatus. 4,193,142, Cl. 4-141.000.
Henry, Nelson R., to Woodman Company, Inc., The. Scale hopper door mechanism. 4,193,465, Cl. 177-108.000.
Hensler, Adolf, to Koflach Sportgerate Gesellschaft m.b.H. Fastener for instep portion of ski shoe. 4,193,215, Cl. 36-50.000.
Herbert, Werner; Kunz, Wunibald; and Pimiskern, Klaus, to Dornier System GmbH. Spinning pot. 4,193,253, Cl. 57-58.890.
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Hermans, Willem F.; and van Eijk, Louwrens J., to Stork Amsterdam B.V. Method for adjustably heating a liquid. 4,194,014, Cl. 426-231.000.
Hermanson, Terry. Umbrella canopy frame and staff construction. 4,193,415, Cl. 135-25.00R.
Herrmann, Henry O., Jr., to AMP Incorporated. Field repairable connector assembly. 4,193,655, Cl. 339-31.00R.
Hershberger, David L., to Harris Corporation. Switching modulators and demodulators utilizing modified switching signal. 4,194,161, Cl. 329-50.000.
Herubel, Jean F., to N. Schlumberger & Cie. Drawing device for sliver. 4,193,170, Cl. 19-127.000.
Hetherington, Robert D.; and Goelz, David W., to Poly-Glas Systems. High-viscosity volume balancing mixing head. 4,193,546, Cl. 239-112.000.
Hetzel, Henry T., to Hewlett-Packard Company. Aperture capacitor pickup. 4,194,084, Cl. 178-19.000.
Heuvel, Norman L. Disc-type airborne vehicle and radial flow gas turbine engine used therein. 4,193,568, Cl. 244-23.00C.
Hewlett-Packard Company: *See*—
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Hewson, John E. Differential pressure transducer process mounting support and manifold. 4,193,420, Cl. 137-356.000.
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Heywood, Joseph R., to Heywood Design Pty. Ltd. Reel spinning and stopping devices. 4,193,599, Cl. 273-143.00R.
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Hilditch, Edward A., to Cuprinol Limited. Compositions containing preservative metals and their use for the preservation of wood and like materials and as fungicides. 4,193,993, Cl. 424-141.000.
Hildon, Anthony M.; and Greenhalgh, Peter F., to Propylox a Societe Anonyme. Epoxidation. 4,193,929, Cl. 260-348.250.
Hilfman, Lee, to UOP Inc. Process for the conversion of aromatic hydrocarbons. 4,194,058, Cl. 585-455.000.
Hill Engineering Company Limited: *See*—
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Hilti Aktiengesellschaft: *See*—
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Hinlein, Sigmund: *See*—
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Hinton, Arthur D.; and Mitchell, Morris E., to Steel Security Corporation. Security storage box. 4,193,353, Cl. 109-50.000.
Hirai, Kazuo; Kamata, Junich; Makiguchi, Sadao; and Iwai, Kazuhiro, to Honda Giken Kogyo Kabushiki Kaisha. Radio receiving device for automotive use. 4,194,155, Cl. 455-345.000.
Hiser, Noble M. Folding table. 4,193,352, Cl. 108-126.000.
Hitachi, Ltd.: *See*—
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Hitz, Gifford L. Sealed connection. 4,193,617, Cl. 285-336.000.
Hobley, William J.; and Rollason, William I. M., to Chrysler United Kingdom Limited. Head/neck support for vehicle seats. 4,193,631, Cl. 297-408.000.
Hochrein, Ambrose A., Jr.: *See*—
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Hoffman, Arthur R.; and Lammers, Gerald B., to International Business Machines Corporation. Charge electrode array for multi-nozzle ink jet array. 4,194,211, Cl. 346-75.000.
Hoffman, Henry C.; and Donohue, James H., to United States of America, National Aeronautics and Space Administration. Active nutation controller. 4,193,570, Cl. 244-165.000.
Hoffmann-La Roche Inc.: *See*—
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Hengartner, Urs; Reymond, Gilbert; and Toome, Valdemar, 4,193,850, Cl. 204-79.000.
Loeliger, Peter, 4,193,931, Cl. 424-308.000.
Mohacsi, Ernest, 4,194,044, Cl. 546-146.000.
Valenta, Zdenek, 4,193,878, Cl. 260-586.00C.
Valenta, Zdenek, 4,193,940, Cl. 260-586.00F.
Hofmann, Dionys, to Gebr. Hofmann, G.m.b.H. & Co. KG, Maschinenfabrik. Methods of and apparatus for balancing a rotor. 4,193,304, Cl. 73-462.000.
Hokushin Electric Works, Ltd.: *See*—
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Holmes, Edward W., to Continental Group, Inc., The. Method of soldering tinplate can bodies with a sulfur resistant tin-alloy solder. 4,193,530, Cl. 228-263.000.
Holmes, William A. Portable water carrier and dispenser. 4,193,518, Cl. 222-105.000.
Holsgrove, Robert J.: *See*—
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Holst, Arno; Kostrzewa, Michael; and Lask, Helmut, to Hoechst Aktiengesellschaft. Method of making hydrophilic articles of water-insoluble polymers. 4,194,024, Cl. 427-180.000.
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Holzem, Heinz; and Henning, Hans J., to Pierburg Luftfahrtgerate Union GmbH. Apparatus for metering fluid flow. 4,193,299, Cl. 73-199.000.
Holzworth, Adolph. Guard for chain saw. 4,193,193, Cl. 30-382.000.
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Honigsbaum, Richard F. Air conditioning system having controllably coupled thermal storage capability. 4,193,271, Cl. 62-180.000.
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Hooker Chemicals & Plastics Corp.: *See*—
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Hopwood, Howard R.; and Trunley, Roy, to Ciba-Geigy Aktiengesellschaft. Process for producing photographic silver halide material. 4,193,801, Cl. 430-570.000.
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Horiuchi, Isao. Fermented feed for ruminants and process for producing same. 4,194,012, Cl. 426-53.000.
Horiuchi, Masao; and Motozuka, Yasuyuki, to Matsushita Electric Industrial Co., Ltd. Holder for holding temperature detecting device employed in microwave ovens. 4,193,572, Cl. 248-535.000.
Horner, Thomas G.; and Ellis, Robert A., to General Motors Corporation. Timing chain snubber. 4,193,314, Cl. 74-242.500.

Horowski, Reinhard: *See*—
Schmiechen, Ralph; Horowski, Reinhard; Palenschat, Dieter; Paschelke, Gert; Wachtel, Helmut; and Kehr, Wolfgang, 4,193,926, Cl. 260-326.50S.

Horstmann Gear Company Limited, The: *See*—
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Hougen, Everett D. Arbor for annular hole cutter. 4,193,721, Cl. 408-68.000.

Houilleres du Bassin du Nord et du Pas de Calais: *See*—
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Hrabal, Hans, to ENFO Grundlagen Forschungs AG. Lamina valve for reciprocating compressors. 4,193,424, Cl. 137-855.000.

Hsieh, Hsiun P.; and Koenig, James J., to Aluminum Company of America. Method of reducing the viscosity of polyester-alumina trihydrate dispersions by slight dehydration of trihydrate. 4,193,908, Cl. 260-40.00R.

Hug, Peter: *See*—
Wyss, Franz J.; and Hug, Peter, 4,193,837, Cl. 159-6.00W.

Hughan, Robert R.: *See*—
Bannister, Michael J.; McKinnon, Neil A.; and Hughan, Robert R., 4,193,857, Cl. 204-195.00S.

Hughes Aircraft Company: *See*—
Lee, Don H., 4,193,182, Cl. 29-571.000.
Patterson, Matthew, 4,193,176, Cl. 29-25.140.

Hughes, Donald W. K.; and Myers, Ronald W., to AMP Incorporated. Electrical connector receptacles. 4,193,654, Cl. 339-17.0LC.

Hukuda, Jyoji: *See*—
Doi, Toshitada; Iga, Akira; Hamada, Osamu; Hukuda, Jyoji; and Hamada, Yuichiro, 4,194,095, Cl. 179-113.000.

Hunt, Leslie; Nicolson, Ian T.; and Whitfield, Thomas M., to Lever Brothers Co. Manufacture of marbled detergent bars. 4,193,752, Cl. 425-131.100.

Hunter, A. Reese: *See*—
Cotton, Worth, Jr.; and Hunter, A. Reese, 4,193,780, Cl. 55-378.000.

Hunter, Lee. Vehicle wheel and tire balance testing machine. 4,193,305, Cl. 73-462.000.

Huster, Lienhard B.: *See*—
Poiger, Hermann; and Huster, Lienhard B., 4,194,017, Cl. 426-533.000.

Hwang, Un-pah: *See*—
Chu, Richard C.; Hwang, Un-pah; and Simons, Robert E., 4,193,445, Cl. 165-79.000.

Ichimura, Takeo: *See*—
Ishibashi, Kazufumi; and Ichimura, Takeo, 4,193,807, Cl. 106-47.00Q.

Ifo Sanitar AB: *See*—
Rosenberg, Ralf H. S.; and Ferm, Morgan H. O., 4,193,141, Cl. 4-1.000.

Iga, Akira: *See*—
Doi, Toshitada; Iga, Akira; Hamada, Osamu; Hukuda, Jyoji; and Hamada, Yuichiro, 4,194,095, Cl. 179-113.000.

Igea, Gilbert L.: *See*—
Devienne, Andre M.; Igea, Gilbert L.; and Bernard, Jean-Pierre L., 4,193,429, Cl. 141-4.000.

Iizuka, Shigeo: *See*—
Saito, Tadao; Nozawa, Takamitsu; Tsuchida, Haruo; Iizuka, Shigeo; and Goto, Takayuki, 4,193,551, Cl. 239-333.000.

Ikeda, Yoshihiko: *See*—
Katsumata, Mitsuo; Sato, Hiroo; Ikeda, Yoshihiko; and Fujita, Tomikazu, 4,193,385, Cl. 123-198.0DC.

Ikenoue, Shinpei; and Masuda, Takao, to Fuji Photo Film Co., Ltd. Process for preparing a composition for a thermally developable light-sensitive material. 4,193,804, Cl. 430-353.000.

Ilardo, Charles S.: *See*—
Chang, Eng P.; Ilardo, Charles S.; and Slagowski, Eugene L., 4,194,072, Cl. 525-432.000.

Ille, David R., to Borg-Warner Corporation. Fluid control system with individually variable flow control mechanism for each control section. 4,193,263, Cl. 60-420.000.

Illinois Tool Works Inc.: *See*—
Boyer, David C.; Danko, Arthur J.; and Ruehl, William E., 4,193,310, Cl. 74-230.300.
Wagner, David P., 4,193,434, Cl. 151-38.000.

Illinois Water Treatment: *See*—
Dillman, Terry R.; and Burke, Dennis J., 4,193,817, Cl. 127-46.00A.

Imai, Hideo: *See*—
Yamamoto, Yoshinori; Imai, Hideo; and Ishimatsu, Yoshikazu, 4,194,229, Cl. 360-137.000.

Imaki, Takao: *See*—
Kojima, Kennosuke; Imaki, Takao; and Ishida, Kozo, 4,193,695, Cl. 356-418.000.

Imbery, Dieter: *See*—
Heim, Ernst; Imbery, Dieter; and Kliemann, Bruno, 4,193,412, Cl. 131-264.000.

Imperial Chemical Industries Limited: *See*—
Caunt, Anthony D.; Vincent, Peter I.; and Newton, Alan B., 4,193,893, Cl. 252-429.00B.
Ruscoe, Colin N. E.; Alner, Henry G. H.; and Baldwin, Brian C., 4,194,001, Cl. 424-273.00R.

Imperial Glass Structure: *See*—
Jankowski, Dieter K., 4,193,237, Cl. 52-200.000.

In Son, Kwok, to W. Haking Enterprises Limited. Shutter striker cocking mechanism. 4,193,678, Cl. 354-204.000.

Incom International Inc.: *See*—
Langford, William D., 4,193,319, Cl. 74-501.00R.

Industrial Air, Inc.: *See*—
Cotton, Worth, Jr.; and Hunter, A. Reese, 4,193,780, Cl. 55-378.000.

Industrie Pirelli S.p.A.: *See*—
Cicognani, Mario, 4,193,312, Cl. 74-231.00C.
Ferrentino, Antonio, 4,193,301, Cl. 73-207.000.

Ing. F. Selmer A/S: *See*—
Gjerde, Trygve, 4,193,714, Cl. 405-204.000.

Ing. T. Furuholmen: *See*—
Gjerde, Trygve, 4,193,714, Cl. 405-204.000.

Ingesson, Lars-Olof: *See*—
Greis, Ingemar; and Ingesson, Lars-Olof, 4,193,446, Cl. 165-108.000.

Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,193,852, Cl. 204-129.460.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method and apparatus for electrical machining with a multi-guided travelling electrode. 4,193,852, Cl. 204-129.460.

Inoue, Morio; Itoh, Kunio; and Asahi, Kunihiko, to Matsushita Electric Industrial Co., Ltd. Method for growing semiconductor crystal. 4,193,835, Cl. 156-606.000.

Inoue, Tadanori: *See*—
Sano, Takezo; and Inoue, Tadanori, 4,193,798, Cl. 430-300.000.

Institut Obschei i Neorganicheskoi Khimii Akademii Nauk Belorusskoi SSR: *See*—
Khodsky, Lev G.; Brazgovskaya, Alla I.; Kaminskaya, Valentina S.; and Podkletnov, Evgeny N., deceased, 4,193,808, Cl. 106-48.000.

Instytut Nawozow Sztucznych: *See*—
Wasala, Tadeusz; Dmoch, Marek; and Jozwiak, Henryk, 4,193,776, Cl. 55-49.000.

Interelectric AG: *See*—
Futterer, Bodo, 4,193,184, Cl. 29-596.000.

International B.F. Goodrich-Europe B.V.: *See*—
Rijnders, Roderick F. R. T., 4,194,034, Cl. 428-36.000.

International Bio-Medical Industries: *See*—
Schlager, Kenneth J., 4,193,393, Cl. 128-710.000.

International Business Machines Corporation: *See*—
Christopherson, Warren A., 4,194,135, Cl. 307-260.000.
Chu, Richard C.; Hwang, Un-pah; and Simons, Robert E., 4,193,445, Cl. 165-79.000.
Hoffman, Arthur R.; and Lammers, Gerald B., 4,194,211, Cl. 346-75.000.
Krause, Konrad A., 4,194,210, Cl. 346-75.000.
Pascoe, Robert A.; Sprott, Charles N.; and Westcott, Douglas W., 4,194,245, Cl. 364-900.000.
Sakmann, Walter, 4,193,703, Cl. 400-124.000.

International Memories, Inc.: *See*—
Hasler, Alfred, 4,194,225, Cl. 360-98.000.

International Paper Company: *See*—
Andrews, Russell S., Jr.; and Moseley, Emmett V., 4,193,840, Cl. 162-49.000.

International Shoe Machine Corporation: *See*—
Becka, Michael M., 4,193,154, Cl. 12-10.100.

International Standard Electric Corporation: *See*—
Ellwood, George, 4,193,664, Cl. 350-96.210.

International Telephone and Telegraph Corporation: *See*—
Arnold, Bruce K., 4,193,665, Cl. 350-96.220.
Davis, Orland L., Jr.; and Moore, Charles E., Jr., 4,194,093, Cl. 179-99.00R.
Loucks, Richard S., 4,194,160, Cl. 328-267.000.

Intrusion-Prepakt, Inc.: *See*—
Lamberton, Bruce A.; and Bindhoff, Eduardo W., 4,193,461, Cl. 175-19.000.

Inukai, Mitsuo, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Webbing retractor for seatbelt system. 4,193,566, Cl. 242-107.40A.

Invernizzi, Rutilio; and Prella, Giovanni, to Societe d'Assistance Technique pour Produits Nestle S.A. Manufacture of cheese. 4,194,011, Cl. 426-8.000.

Ireland, Richard D.: *See*—
Dick, Charles B.; Knutson, Curtis L.; Jones, Frederick W.; and Ireland, Richard D., 4,193,529, Cl. 228-107.000.

Irmer, Adolf, to Wavin B.V. Plastic socket pipe part. 4,193,426, Cl. 138-109.000.

Ishibashi, Kazufumi; and Ichimura, Takeo, to Nippon Kogaku K.K. Optical glass. 4,193,807, Cl. 106-47.00Q.

Ishida, Kozo: *See*—
Kojima, Kennosuke; Imaki, Takao; and Ishida, Kozo, 4,193,695, Cl. 356-418.000.

Ishiguro, Yasuo; Wakazono, Kenji; and Saito, Toshihisa, to Copal Company Limited. Digital shutter control circuit. 4,193,673, Cl. 354-23.00D.

Ishihara Sangyo Kabushiki Kaisha Ltd.: *See*—
Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, 4,193,790, Cl. 71-116.000.

Ishihara, Takayuki: *See*—
Tanigawa, Koichi; and Ishihara, Takayuki, 4,193,681, Cl. 355-3.0FU.

Ishikawa, Hirotoshi: *See*—
Kotaka, Mitsuo; Ishikawa, Hirotoshi; Muraki, Kaisuke; Takahashi, Ryo; and Matsuura, Tamizo, 4,194,118, Cl. 250-343.000.

Ishikawa, Kazumi: *See*—
Nakajima, Takashi; Nagano, Katsuto; and Ishikawa, Kazumi, 4,194,108, Cl. 219-216.000.

Ishikawa, Ken-ichi. Liquid sprayer pipe with inclined slits. 4,193,552, Cl. 239-533.130.

Ishimatsu, Yoshikazu: *See*—
Yamamoto, Yoshinori; Imai, Hideo; and Ishimatsu, Yoshikazu, 4,194,229, Cl. 360-137.000.

Isogai, Yo: *See*—
Shudo, Koichi; Okamoto, Toshihiko; Isogai, Yo; and Takahashi, Soshiro, 4,193,788, Cl. 71-94.000.

ITI Limited: *See*—
Mougin, Georges L., 4,193,712, Cl. 405-52.000.

Ito, Akihiko: *See*—
Kaetsu, Isao; Watanabe, Hiroshi; Sato, Tomotaro; and Ito, Akihiko, 4,193,845, Cl. 435-182.000.

Itoh, Kunio: *See*—
Inoue, Morio; Itoh, Kunio; and Asahi, Kunihiko, 4,193,835, Cl. 156-606.000.

Itoh, Tadahara: *See*—
Kawamata, Naoyuki; Itoh, Tadahara; and Takahashi, Noriaki, 4,193,971, Cl. 423-242.000.

ITT Industries, Inc.: *See*—
Hodges, Robert J., 4,194,105, Cl. 200-159.00B.

Iverson, Dennis H. Machinery seal. 4,193,606, Cl. 277-205.000.

Iwai, Kazuhiro: *See*—
Hirai, Kazuo; Kamata, Junich; Makiguchi, Sadao; and Iwai, Kazuhiro, 4,194,155, Cl. 455-345.000.

Iwama, Hideaki; Koyama, Mikio; Tsuda, Yasuo; and Asano, Masao, to Konishiroku Photo Industry Co., Ltd. Photographic dye mordant. 4,193,800, Cl. 430-213.000.

J & D Enterprises: *See*—
White, Jack E., 4,193,576, Cl. 251-149.600.

Jackson, Herman R. Drycleaning assembly and method for removing impurities and residual moisture from an organic drycleaning solvent. 4,193,765, Cl. 8-142.000.

Jackson, Theodore A., to Cadillac Gage Company. Gun sight positioning mechanism. 4,193,334, Cl. 89-41.00E.

Jaconette, Frank C., to Harvey Hubbell, Incorporated. Electrical contact assembly. 4,193,660, Cl. 339-191.00R.

Jacques, Andre: *See*—
d'Auria, Luigi; Dubos, Jacques; and Jacques, Andre, 4,193,661, Cl. 350-96.160.

Jakob, Herbert E. Asphalt paving planer with conveyor forwardly of cutting drum. 4,193,636, Cl. 299-39.000.

James, Forrest H., Jr.; and Silberman, Ira J., to Diversified Products Corporation. Method and apparatus for filling containers with a relatively viscous material. 4,193,430, Cl. 141-12.000.

James, Robert C.; and Kovacs, Lloyd, to Hayssen Manufacturing Company. Apparatus for feeding stacks of sheets, such as reams of paper. 4,193,491, Cl. 198-476.000.

Jamieson Manufacturing Company, Inc.: *See*—
Kesselring, Wolfgang, 4,193,727, Cl. 414-223.000.

Janka, Kauko, to Wallac Oy. Method and an instrument for the measurement of the flow rate of gases based on ionization. 4,193,296, Cl. 73-194.00F.

Jankowski, Dieter K., to Imperial Glass Structure. Skylight structure. 4,193,237, Cl. 52-200.000.

Jansen, Richard F.: *See*—
Birum, Gail H.; and Jansen, Richard F., 4,193,914, Cl. 260-45.85R.

Japan Atomic Energy Research Institute: *See*—
Kaetsu, Isao; Watanabe, Hiroshi; Sato, Tomotaro; and Ito, Akihiko, 4,193,845, Cl. 435-182.000.
Kaetsu, Isao; and Kumkaura, Minoru, 4,194,066, Cl. 435-182.000.

Jarrett, Steven M.; and Leitner, Michael W., to Spectra-Physics, Inc. Unidirectional ring laser apparatus and method. 4,194,168, Cl. 331-94.50C.

Jarvis, William M.; and Kim, Keun Y., to Monsanto Company. Process for stabilization of dicalcium phosphate. 4,193,973, Cl. 423-265.000.

Jayaram, Krishnaswamy; and Reusch, Michael F. Electrical invertor apparatus. 4,194,239, Cl. 363-109.000.

Jeambey, Calhoun G. Apparatus for recovery of petroleum from petroleum impregnated media. 4,193,448, Cl. 166-60.000.

Jelks, Edward C., to United States of America, Navy. Zinc oxide on silicon device for parallel in, serial out, discrete fourier transform. 4,194,171, Cl. 333-149.000.

Jensen, Knud; and Cooper, Ralph F. Masonry block insulating device. 4,193,241, Cl. 52-405.000.

Jepson, John W.: *See*—
Reid, Walter L., Jr.; Delano, Ralph L.; and Jepson, John W., 4,193,601, Cl. 273-167.00R.

Jerila, Torsti T. T., to Acme General Corporation. Door latch. 4,193,619, Cl. 292-168.000.

Jester, Alfred: *See*—
Womack, Robert E.; Lawrie, William E.; and Jester, Alfred, 4,193,843, Cl. 176-19.0LD.

Jezek, Bruce W.; and McClung, Glen L., to United States of America, Army. Apparatus for assembling threaded base to a projectile. 4,193,328, Cl. 81-72.000.

Jinotti, Walter J. Dual purpose catheter. 4,193,406, Cl. 128-204.180.

Johansson, Bengt; and Nilsson, Erland, to ASEA Aktiebolag. Spark gap devices. 4,194,138, Cl. 313-3.000.

Johansson, Rolf K.: *See*—
Pettersson, Axel J. M.; and Johansson, Rolf K., 4,194,236, Cl. 362-66.000.

John, Frank T., to A-T-O Inc. Microminiature palladium oxide gas detector and method of making same. 4,193,964, Cl. 422-90.000.

Johns, Marvin D.; Denton, Gordon W.; and Heymann, Ronald E., to Dana Corporation. Air pressure loaded clutch. 4,193,485, Cl. 192-85.0CA.

Johnson, Gordon W.: *See*—
Bubula, Thomas J.; Franz, Maurice F.; Johnson, Gordon W.; and Rinaldo, James D., 4,193,323, Cl. 74-733.000.

Johnson & Johnson: *See*—
Repke, Virginia L.; and Shepherd, Robert C., 4,193,404, Cl. 128-280.000.

Johnson, Larry K., to Lawrence Brothers, Inc. Door frame construction. 4,193,245, Cl. 52-656.000.

Johnson, Philip: *See*—
Juttelstad, David L.; and Johnson, Philip, 4,193,550, Cl. 239-314.000.

Johnson, Ralph E., to Singer Company, The. Sewing machine construction utilizing subassemblies. 4,193,361, Cl. 112-259.000.

Johnson, Robert M. Flexible saw. 4,193,188, Cl. 30-166.00R.

Jones, Addison B.; and Wittry, David B., to Rockwell International Corporation. Mask apparatus for fine-line lithography. 4,194,233, Cl. 361-233.000.

Jones, Addison B.: *See*—
Reekstin, John P.; Plonski, Sigfried G.; and Jones, Addison B., 4,193,687, Cl. 356-150.000.

Jones, Frederick W.: *See*—
Dick, Charles B.; Knutson, Curtis L.; Jones, Frederick W.; and Ireland, Richard D., 4,193,529, Cl. 228-107.000.

Jones, Sylvanus B. Hub cap locking device. 4,193,640, Cl. 301-37.0AT.

Jonsereds AB: *See*—
Satterberg, Lars H.; and Eliasson, Hans, 4,193,505, Cl. 212-55.000.

Joray, Marvin L.: *See*—
Kessens, Norman J.; and Joray, Marvin L., 4,193,250, Cl. 56-208.000.

Jordinger, Stig: *See*—
Forslund, Lennart; Jordinger, Stig; and Kolavcic, Pavel, 4,193,294, Cl. 73-141.00A.

Josephson, Louis, to American Hardware & Paint Co., Inc. Seal for damper blades. 4,193,605, Cl. 277-184.000.

Jozwiak, Henryk: *See*—
Wasala, Tadeusz; Dmoch, Marek; and Jozwiak, Henryk, 4,193,776, Cl. 55-49.000.

Junghans, Klaus, to Schering Aktiengesellschaft. Preparation of 4,4'-dipyridyls. 4,194,046, Cl. 546-259.000.

Juttelstad, David L.; and Johnson, Philip, to Dura Corporation. Chemical injection head. 4,193,550, Cl. 239-314.000.

Kabushiki Kaisha Kantool: *See*—
Hasegawa, Kiyoshi, 4,194,218, Cl. 358-100.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Nakamura, Joji; and Furumi, Kihachiro, 4,193,634, Cl. 299-17.000.

Kabushiki Kaisha Kubota Seisakusho: *See*—
Kubota, Tokihito, 4,193,536, Cl. 233-11.000.

Kabushiki Kaisha Nihon Kensho: *See*—
Abe, Seiji, 4,193,595, Cl. 273-1.00R.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Inukai, Mitsuo, 4,193,566, Cl. 242-107.40A.
Tamura, Keiichi, 4,193,565, Cl. 242-107.40A.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Oshima, Yujiro, 4,193,382, Cl. 123-119.00A.

Kaetsu, Isao; Watanabe, Hiroshi; Sato, Tomotaro; and Ito, Akihiko, to Japan Atomic Energy Research Institute. Immobilization of enzymes or bacterial cells. 4,193,845, Cl. 435-182.000.

Kaetsu, Isao; and Kumkaura, Minoru, to Japan Atomic Energy Research Institute. Immobilization of enzymes or bacteria cells. 4,194,066, Cl. 435-182.000.

Kagotani, Keiichi: *See*—
Shimada, Yoshio; Kagotani, Keiichi; Noda, Norio; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,194,065, Cl. 435-133.000.

Kahn, Leonard R. Narrow bandwidth network compensation method and apparatus. 4,194,154, Cl. 455-114.000.

Kahn, William M.: *See*—
Armstrong, Roy; and Kahn, William M., 4,193,600, Cl. 273-148.00R.

Kalnins, John Z., to McPheasons Limited. Process for curing thermosetting resins and elastomers. 4,193,956, Cl. 264-27.000.

Kamata, Junich: *See*—
Hirai, Kazuo; Kamata, Junich; Makiguchi, Sadao; and Iwai, Kazuhiro, 4,194,155, Cl. 455-345.000.

Kaminskaya, Valentina S.: *See*—
Khodsky, Lev G.; Brazgovskaya, Alla I.; Kaminskaya, Valentina S.; and Podkletnov, Evgeny N., deceased, 4,193,808, Cl. 106-48.000.

Kamyr, Inc.: *See*—
Sherman, Michael I., 4,193,839, Cl. 162-19.000.

Kanai, Akira: *See*—
Miyashita, Masakazu; and Kanai, Akira, 4,193,644, Cl. 308-9.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Shimada, Yoshio; Kagotani, Keiichi; Noda, Norio; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,194,065, Cl. 435-133.000.

Kanno, Masashi: *See*—
Tanabe, Kenzo; and Kanno, Masashi, 4,194,158, Cl. 455-333.000.

Kano, Yasuo; Furukawa, Shunsuke; and Mifune, Tadayoshi, to Sony Corporation. Semiconductor image sensor having CCD shift register. 4,194,213, Cl. 357-24.000.

Kanyo, Erzsebet: *See*—
Szantay, Csaba; Szabo, Lajos; Toth, Istvan; Kanyo, Erzsebet; Sebestyen, Gyula; and Virag, Sandor, 4,193,998, Cl. 424-258.000.

Kanzaka, Yoshihiro, to Yoshida Kogyo K.K. Ornamental attachment for slide fastener sliders. 4,193,172, Cl. 24-205.15H.
Kao Soap Co., Ltd.: *See*—
Nakagawa, Yunosuke; and Kikuchi, Minoru, 4,193,977, Cl. 423-415.00P.
Kapaun, R. Glenn: *See*—
Shepherd, Gary D.; Fernandez, Ramon B.; Kapaun, R. Glenn; and Logan, Charles P., 4,193,252, Cl. 57-351.000.
Kapetanakos, Christos A.: *See*—
Pasour, John A.; Kapetanakos, Christos A.; Mahaffey, Redge A.; and Golden, Jeffry, 4,194,139, Cl. 313-153.000.
Karch, Walter J.: *See*—
Canfield, Sheldon A.; and Karch, Walter J., 4,194,077, Cl. 13-6.000.
Karelin, Jochen: *See*—
Neumann, Gerhard M.; and Karelin, Jochen, 4,193,844, Cl. 176-37.000.
Karl Lautenschlager KG, Mobelbeschlagfabrik: *See*—
Lautenschlager, Reinhard, 4,193,163, Cl. 16-137.000.
Karle, David A.: *See*—
Young, Jack H.; Karle, David A.; and Halleck, Frank E., 4,193,818, Cl. 134-1.000.
Karlsson, Stig I.: *See*—
Noren, Kjell S.; and Karlsson, Stig I., 4,194,180, Cl. 340-183.000.
Karol, Frederick J.: *See*—
Goeke, George L.; and Karol, Frederick J., 4,193,892, Cl. 252-428.000.
Kaseta, Robert; Daugherty, Lenn; and Hinlein, Sigmund, to Data General Corporation. Rigid magnetic disc memory apparatus including open loop stepper-motor-driven read/write head. 4,194,226, Cl. 360-106.000.
Katayama, Kenji: *See*—
Yasumatsu, Mutsuo; Katayama, Kenji; Takeuchi, Shozo; and Saito, Yoshio, 4,194,019, Cl. 426-580.000.
Kathawala, Faizulla G., to Sandoz, Inc. Cholesterol ester-reducing amides of hexahydroindolinols. 4,194,002, Cl. 424-274.000.
Kato Electric and Machinery Co., Ltd: *See*—
Okayama, Hirohumi, 4,193,164, Cl. 16-141.000.
Katsumata, Mitsuo; Sato, Hiroo; Ikeda, Yoshihiko; and Fujita, Tomikazu, to Kokusan Denki Co., Ltd. Engine stopping device. 4,193,385, Cl. 123-198.0DC.
Katsura Machine Co., Ltd.: *See*—
Sekiguchi, Yoji, 4,193,754, Cl. 425-424.000.
Katz, Joseph. Tidal depth calculator. 4,194,111, Cl. 235-83.000.
Kauffman, William J.; and Lilley, George L., to Armstrong Cork Company. Process for forming a surface covering having decorative effects. 4,193,957, Cl. 264-46.400.
Kaulmann, Gunter: *See*—
Peichl, Rolf; and Kaulmann, Gunter, 4,193,621, Cl. 293-142.000.
Kawahara, Tsukasa: *See*—
Uchida, Mitsuo; Oguri, Yasuo; Saito, Junji; and Kawahara, Tsukasa, 4,193,958, Cl. 264-86.000.
Kawaharada, Hajime: *See*—
Shimada, Yoshio; Kagotani, Keiichi; Noda, Norio; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,194,065, Cl. 435-133.000.
Kawamata, Naoyuki; Itoh, Tadahara; and Takahashi, Noriaki, to Kawasaki Jukogyo Kabushiki Kaisha. Process for removal of sulfur oxides from waste gases. 4,193,971, Cl. 423-242.000.
Kawano, Tadaaki: *See*—
Hamaguchi, Hiroshi; and Kawano, Tadaaki, 4,193,376, Cl. 118-658.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Kawamata, Naoyuki; Itoh, Tadahara; and Takahashi, Noriaki, 4,193,971, Cl. 423-242.000.
Kayaba Industry Co., Ltd.: *See*—
Kojima, Rinzo; Shibata, Kazuhiro; and Nagata, Sachio, 4,193,825, Cl. 148-16.600.
Kayama, Nagaoki; and Suzuki, Kazuie, to Hokushin Electric Works, Ltd. Excitation system for electromagnetic flowmeter. 4,193,298, Cl. 73-194.0EM.
Kayex Corporation: *See*—
Gill, Gerald L., Jr.; and Rioux, Philip J., 4,193,226, Cl. 51-124.00R.
Keeley, Ronald. Portable sports equipment organizer. 4,193,495, Cl. 206-315.00R.
Keffer, Francis C.: *See*—
Kelly, Charles M.; and Keffer, Francis C., 4,193,553, Cl. 239-586.000.
Kehr, Wolfgang: *See*—
Schmiechen, Ralph; Horowski, Reinhard; Palenschat, Dieter; Paschelke, Gert; Wachtel, Helmut; and Kehr, Wolfgang, 4,193,926, Cl. 260-326.50S.
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Malinouskas, Donald, to Becton, Dickinson & Company. Active antenna for medical telemetry monitoring systems. 4,194,179, Cl. 340-211.000.
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Marc, Michel, to Clint, Inc. Bicycle sprocket drive apparatus with elliptical pedal path. 4,193,324, Cl. 74-750.00B.
Marchak, Roman O.; and Peterson, William A., Jr., to Bendix Corporation, The. Start and warm up features for electronic fuel management systems. 4,193,380, Cl. 123-32.0EG.
Marchant, Ian M.; and Faville, Warwick S., to Kins Developments Limited. Rail clip assemblies. 4,193,544, Cl. 238-347.000.
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Marinello, Rosolino. Orbital compression chamber for the cure of internal wounds and inflammation of the ocular apparatus and central nervous system. 4,193,401, Cl. 128-260.000.
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Martin, James L. Electrical switch controllable alternatively by an internal timer and by digital information from a remote source. 4,194,182, Cl. 340-310.00R.
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Massie, Lewis E. Engraving machines. 4,193,200, Cl. 33-25.00B.
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Mazzoni, Renato J.; Mistrick, George R.; and Rosskamp, Barent A., to PPG Industries, Inc. Multiple glazed unit having an adhesive cleat. 4,193,236, Cl. 52-172.000.
McArthur, Alexander D.; Holsgrove, Robert J.; and Hodge, Gerard, to Persista, Inc. Coating roller. 4,193,178, Cl. 29-129.500.
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McDermott, Peter; and Fattori, Lazzaro A., to Plastic Reel Corporation of America. Storage and shipping container. 4,193,497, Cl. 206-387.000.
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McHugh, Neil M., to Colgate-Palmolive Company. Color-yielding scouring cleanser compositions. 4,193,888, Cl. 252-99.000.
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McKerns, Kenneth W. Contraceptive, antibody generating, polypeptides. 4,193,915, Cl. 260-112.50R.
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Meijer, Peter J. N.; and Nieuwkamp, Johannes G. M., to Stamicarbon, B.V. Process for preparing 2-pyrrolidone. 4,193,925, Cl. 260-326.5FN.
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Melan, Giuseppe-Fabrizio M.; and Nicouland, Jean R., to Saint-Gobain Industries. Strand attenuation and winding apparatus. 4,193,557, Cl. 242-18.00A.
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Merkle, Josef, to Daimler-Benz Aktiengesellschaft. Truck with driver cab. 4,193,629, Cl. 296-190.000.
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Meyer, Larry P., to Nelson Irrigation Corporation. High capacity sprinkler head with improved brake mechanism. 4,193,548, Cl. 239-230.000.
Meyer, Walter, to Deutsche Babcock Aktiengesellschaft. Arrangement for preventing excess pressure in the housing of shut-off valves. 4,193,418, Cl. 137-118.000.
Meyers, Peter S., to Chromalloy American Corporation. Ion exchange method and apparatus. 4,193,868, Cl. 210-35.000.
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Miller, Carl A.: *See—*
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Milne, James A., to Pace Incorporated. Method of surface laminating. 4,193,830, Cl. 156-306.000.
Mine Safety Appliances Company: *See—*
Wise, Layton A.; and Menold, Robert F., 4,193,507, Cl. 215-12.00R.
Mines, Gordon L.: *See—*
Haller, Jacob S.; Mines, Gordon L.; and Mischnick, Meinert J., 4,193,187, Cl. 29-749.000.
Minichillo, Ronald A.: *See—*
Broyles, Wayne R., 4,193,477, Cl. 182-194.000.
Minke, Rudeger: *See—*
Schmidt, Werner; and Minke, Rudeger, 4,193,912, Cl. 260-45.75B.
Minnesota Mining and Manufacturing Company: *See—*
Ebbinga, Richard D., 4,194,222, Cl. 360-18.000.
Knox, Michael P., 4,193,330, Cl. 83-364.000.
Minolta Camera Kabushiki Kaisha: *See—*
Mori, Hiromi, 4,194,112, Cl. 235-132.00E.
Ueda, Hiroshi; Saito, Mitsuru; Nanba, Yasuhiro; and Kuramoto, Yoshio, 4,193,676, Cl. 354-106.000.
Yasukuni, Mitsuo; Ogura, Toshinobu; Omaki, Takanobu; and Tanaka, Masahide, 4,193,667, Cl. 350-187.000.
Mirza, Rohinton M., to Metalwash Machinery Corporation. Can handling equipment. 4,193,374, Cl. 118-58.000.
Misawa, Yutaka: *See—*
Mochizuki, Yasuhiro; Hachino, Hiroaki; Yasuda, Yasumichi; Misawa, Yutaka; and Ogawa, Takuzo, 4,193,826, Cl. 148-189.000.
Mischnick, Meinert J.: *See—*
Haller, Jacob S.; Mines, Gordon L.; and Mischnick, Meinert J., 4,193,187, Cl. 29-749.000.
Mistrick, George R.: *See—*
Mazzoni, Renato J.; Mistrick, George R.; and Rosskamp, Barent A., 4,193,236, Cl. 52-172.000.
Mitchell, Carol J.: *See—*
Mitchell, Eugene C.; and Mitchell, Carol J., 4,194,122, Cl. 250-476.000.
Mitchell, Eugene: *See—*
Mitchell, Eugene C.; and Mitchell, Carol J., 4,194,122, Cl. 250-476.000.
Mitchell, Eugene C.; and Mitchell, Carol J., to Mitchell, Eugene. Apparatus for the marking of X-ray film. 4,194,122, Cl. 250-476.000.
Mitchell, Morris E.: *See—*
Hinton, Arthur D.; and Mitchell, Morris E., 4,193,353, Cl. 109-50.000.
Mitsubishi Chemical Industries, Limited: *See—*
Uchida, Mitsuo; Oguri, Yasuo; Saito, Junji; and Kawahara, Tsukasa, 4,193,958, Cl. 264-86.000.
Mitsui, Akio: *See—*
Mukunoki, Yasuo; Naito, Hideki; and Mitsui, Akio, 4,193,802, Cl. 430-139.000.
Mitsui Toatsu Chemicals Inc.: *See—*
Yamamoto, Ryuichi; Yamamoto, Kousuke; Nagata, Teruyuki; and Obata, Kenji, 4,193,932, Cl. 260-453.0PH.
Miyashita, Masakazu; and Kanai, Akira, to Citizen Watch Co., Ltd. Servo control system. 4,193,644, Cl. 308-9.000.
Mizunaga, Shinji: *See—*
Shindo, Akio; and Mizunaga, Shinji, 4,193,427, Cl. 139-54.000.
Mobil Oil Corporation: *See—*
Chang, Clarence D., 4,193,864, Cl. 208-210.000.
Cushman, Donald R.; Pagen, Charles A.; and Schick, John W., 4,194,023, Cl. 427-138.000.
Frangatos, Gerassimos, 4,193,883, Cl. 252-49.900.
Gemmill, Robert M., Jr., 4,193,882, Cl. 252-47.500.
Goldstein, Theodore P., 4,193,454, Cl. 166-302.000.
Wilson, Peggy M.; and Pao, Julie, 4,193,452, Cl. 166-274.000.
Mochizuki, Manabu; Suzuki, Kohji; Oyama, Hajime; and Ohnuma, Teruyuki, to Ricoh Company, Ltd. Electrophotographic apparatus comprising improved imaging system. 4,193,679, Cl. 355-1.000.
Mochizuki, Yasuhiro; Hachino, Hiroaki; Yasuda, Yasumichi; Misawa, Yutaka; and Ogawa, Takuzo, to Hitachi, Ltd. Vapor phase diffusion of aluminum with or without boron. 4,193,826, Cl. 148-189.000.
Modern Precision Engineers & Associates Limited: *See—*
Clements, Harold J.; and Ely, Frank, 4,193,341, Cl. 100-93.00P.
Moench, Jerry D., to Motorola, Inc. Digital predecoding system. 4,194,130, Cl. 307-205.000.
Mohacsi, Ernest, to Hoffmann-La Roche Inc. Process for preparing 3-phenoxy morphinans. 4,194,044, Cl. 546-146.000.
Mohiuddin, Mohammed S. Illuminated master calendar and message recording system. 4,194,196, Cl. 340-711.000.
Molins, Desmond W., to Molins Limited. Continuous web supply apparatus. 4,193,558, Cl. 242-58.400.
Molins Limited: *See—*
Molins, Desmond W., 4,193,558, Cl. 242-58.400.
Williams, Robert E.; and Marritt, Clifford R., 4,193,410, Cl. 131-170.00R.
Molloy, Bryan B.; and Schmiegel, Klaus K., to Eli Lilly and Company. Aryloxyphenylpropylamines for obtaining a psychotropic effect. 4,194,009, Cl. 424-330.000.
Molyneux, George, to Radway Plastics Limited. Sills for building construction. 4,193,231, Cl. 52-97.000.
Mondt, Josef; Rauterkus, Karl J.; and Rinno, Helmut, to Hoechst Aktiengesellschaft. Finely particulate plastics dispersions prepared by metering a mixture containing four monomers into an aqueous liquor containing an anionic emulsifier. 4,193,902, Cl. 260-29.6TA.
Mongagnino, James G., to Pitney Bowes Inc. Sheet separator and feeding apparatus. 4,193,590, Cl. 271-119.000.
Monitek, Inc.: *See—*
Wynn, William H., 4,193,692, Cl. 356-341.000.
Monsanto Company: *See—*
Bachman, Gerald L.; and Vineyard, Billy D., 4,194,051, Cl. 560-60.000.
Birum, Gail H.; and Jansen, Richard F., 4,193,914, Cl. 260-45.85R.
Jarvis, William M.; and Kim, Keun Y., 4,193,973, Cl. 423-265.000.
Villadsen, John, 4,193,894, Cl. 252-440.000.
Montedison S.p.A.: *See—*
Bertelli, Guido; Roma, Pierpaolo; and Locatelli, Renato, 4,193,945, Cl. 525-2.000.
Moore Business Forms, Inc.: *See—*
Allen, Robert H., 4,193,501, Cl. 206-610.000.
Moore, Charles E., Jr.: *See—*
Davis, Orland L., Jr.; and Moore, Charles E., Jr., 4,194,093, Cl. 179-99.00R.
Moores, Peter R.; and Shoffner, James E., to Fiber Materials, Inc. Method of forming carbon composites. 4,193,828, Cl. 156-148.000.
Morgan, Charles W.: *See—*
Goodale, Clark W.; Morgan, Charles W.; Rhoton, Albert L.; and McNeil, David F., 4,194,026, Cl. 427-244.000.
Mori, Hiromi, to Minolta Camera Kabushiki Kaisha. Presetting counter device. 4,194,112, Cl. 235-132.00E.
Morino, Hideki; and Yasui, Yasuyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Casing for power transmission unit for automotive vehicle. 4,193,322, Cl. 74-700.000.
Morrison, Steven; and Lisle, Thomas K., Jr., to United States of America, Air Force. Digital hysteresis circuit. 4,194,186, Cl. 340-347.0AD.
Morse, Glenn B. Torsional vibration dampener. 4,193,724, Cl. 409-141.000.
Moseley, Emmett V.: *See—*
Andrews, Russell S., Jr.; and Moseley, Emmett V., 4,193,840, Cl. 162-49.000.
Moser, Roland: *See—*
Audykowski, Thaddeus; and Moser, Roland, 4,193,905, Cl. 260-30.60R.
Motai, Takeji, to Shin-Asahigawa Co., Ltd. Process for treating wood. 4,194,033, Cl. 427-351.000.
Motoren-Werke Mannheim AG: *See—*
Dietrich, Werner; and Hiemesch, Oswald, 4,193,379, Cl. 123-32.00C.
Motorola, Inc.: *See—*
Moench, Jerry D., 4,194,130, Cl. 307-205.000.
Motozuka, Yasuyuki: *See—*
Horiuchi, Masao; and Motozuka, Yasuyuki, 4,193,572, Cl. 248-535.000.
Mougin, Georges L., to ITI Limited. Wall for protecting tabular icebergs against the mechanical effects of waves. 4,193,712, Cl. 405-52.000.
Moulin, Michel: *See—*
Farkas, Rudolf; and Moulin, Michel, 4,194,143, Cl. 315-241.00R.
Mrazek, Dale A.; and Reinschmidt, Robert M., to National Semiconductor Corporation. Tristate logic buffer circuit with enhanced dynamic response. 4,194,131, Cl. 307-209.000.
Mrazek, Dale A., to National Semiconductor Corporation. Tristate logic buffer circuit with reduced power consumption. 4,194,132, Cl. 307-209.000.

Mueller, Walter B., to W. R. Grace & Co. Multi-layer polyolefin shrink film. 4,194,039, Cl. 428-213.000.

Muenger, James R.; and Barber, Everett M., to Texaco Inc. Process for the generation of power from carbonaceous fuels with minimal atmospheric pollution. 4,193,259, Cl. 60-39.040.

Mukunoki, Yasuo; Naito, Hideki; and Mitsui, Akio, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material containing aromatic ester solvent. 4,193,802, Cl. 430-139.000.

Muller, Alain; Mathey, Francois; and Bensoam, Jean, to Compagnie Francaise de Raffinage. Production of hydrogen. 4,193,978, Cl. 423-648.00R.

Muller, Friedemann: *See—*
Wingler, Frank; Eicher, Theobald; Muller, Friedemann; Fischer, Winfried; and Prinz, Richard, 4,193,897, Cl. 260-17.00R.

Muller, Jurgen; Pfeifer, Josef; Rheude, Alfred; Erckel, Rolf; Farber, Heinrich; and Zrenner, Bernhard, to AGFA-Gevaert, A.G. Apparatus for developing latent images of X-rayed objects. 4,193,682, Cl. 355-10.000.

Mumford, Eustace H., to Owens-Illinois, Inc. Method of loading containers into an annealing lehr. 4,193,784, Cl. 65-69.000.

Murai, Yoshikazu; Tsuji, Okitsugu; and Sato, Atsushi, to Nippon Petrochemicals Co., Ltd. Fat-liquoring compositions for leather. 4,193,764, Cl. 8-94.220.

Muraki, Kaisuke: *See—*
Kotaka, Mitsuo; Ishikawa, Hirotoshi; Muraki, Kaisuke; Takahashi, Ryo; and Matsuura, Tamizo, 4,194,118, Cl. 250-343.000.

Murphy, Donald W.: *See—*
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Murtazin, Khafiz M.: *See—*
Berber, Viktor A.; Pervushin, Evgeny S.; Murtazin, Khafiz M.; Kholin, Vladimir G.; and Galishnikov, Boris M., 4,193,288, Cl. 73-1.00R.

Myers, Ronald W.: *See—*
Hughes, Donald W. K.; and Myers, Ronald W., 4,193,654, Cl. 339-17.0LC.

N L Industries, Inc.: *See—*
Finlayson, Claude M., 4,193,806, Cl. 106-20.000.

N. Schlumberger & Cie: *See—*
Herubel, Jean F., 4,193,170, Cl. 19-127.000.

Nagano, Katsuto: *See—*
Nakajima, Takashi; Nagano, Katsuto; and Ishikawa, Kazumi, 4,194,108, Cl. 219-216.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Speed-changing device for bicycle. 4,193,309, Cl. 74-217.00B.

Nagata, Sachio: *See—*
Kojima, Rinzo; Shibata, Kazuhiro; and Nagata, Sachio, 4,193,825, Cl. 148-16.600.

Nagata, Teruyuki: *See—*
Yamamoto, Ryuichi; Yamamoto, Kousuke; Nagata, Teruyuki; and Obata, Kenji, 4,193,932, Cl. 260-453.0PH.

Nagy, Sandor: *See—*
Agocs, Pal; Fabian, Istvan; Gajdacsi, Andras; Nagy, Sandor; and Pinter, Zoltan, 4,193,922, Cl. 548-132.000.

Naito, Hideki: *See—*
Mukunoki, Yasuo; Naito, Hideki; and Mitsui, Akio, 4,193,802, Cl. 430-139.000.

Naito, Makoto. Apparatus for generating finely divided particulate bubbles. 4,193,949, Cl. 261-87.000.

Nakagawa, Yunosuke; and Kikuchi, Minoru, to Kao Soap Co., Ltd. Process for preparing foamable sodium percarbonate. 4,193,977, Cl. 423-415.00P.

Nakajima, Takashi; Nagano, Katsuto; and Ishikawa, Kazumi, to TDK Electronics Co., Ltd. Thermal printing head and method of making same. 4,194,108, Cl. 219-216.000.

Nakamura, Joji; and Furumi, Kihachiro, to Kabushiki Kaisha Komatsu Seisakusho. Method and apparatus for excavation. 4,193,634, Cl. 299-17.000.

Nakano, Kunihiro: *See—*
Hasegawa, Hiroshi; and Nakano, Kunihiro, 4,193,677, Cl. 354-127.000.

Namboodri, Chettoor G., to United Merchants and Manufacturers, Inc. Textile treatment process. 4,193,762, Cl. 8-14.000.

Nanaumi, Kazuyuki; and Baba, Koji, to Orion Machinery Co., Ltd. Heat exchanger for cooling system compressed air dehumidifiers. 4,193,443, Cl. 165-66.000.

Nanba, Yasuhiro: *See—*
Ueda, Hiroshi; Saito, Mitsuru; Nanba, Yasuhiro; and Kuramoto, Yoshio, 4,193,676, Cl. 354-106.000.

Narayanaswami, Subramaniyan: *See—*
Leeming, Michael R. G.; Narayanaswami, Subramaniyan; and Penrose, Alexander B., 4,193,994, Cl. 424-249.000.

National Can Corporation: *See—*
Maeder, Edward G., 4,193,279, Cl. 72-44.000.

National Research Development Corporation: *See—*
Wong, Henry H. Y., 4,193,234, Cl. 52-173.00R.

National Semiconductor Corporation: *See—*
Bernardi, Carl E., 4,193,834, Cl. 156-521.000.
Klein, Thomas, 4,193,183, Cl. 29-578.000.
Mrazek, Dale A.; and Reinschmidt, Robert M., 4,194,131, Cl. 307-209.000.
Mrazek, Dale A., 4,194,132, Cl. 307-209.000.

NCR Corporation: *See—*
Bowman, Rodney V.; and Francis, Martin H., 4,193,539, Cl. 235-92.0NG.
Bradam, William R., 4,194,097, Cl. 200-5.00A.
Fulks, Robert G.; Enfield, Robert E.; and Sacher, Eric, 4,194,113, Cl. 371-20.000.
Reynolds, Jack H., 4,194,144, Cl. 318-341.000.

Neff, Paul C., to Northwest Molded Products Corporation. Knob for a pan cover. 4,193,166, Cl. 16-121.000.

Neilsen, Roger P. Jack for lifting objects. 4,193,582, Cl. 254-131.000.

Nelson Irrigation Corporation: *See—*
Meyer, Larry P., 4,193,548, Cl. 239-230.000.

Nelson, Ned H. Ball retrieving and storage bag. 4,193,625, Cl. 294-19.00A.

Neogi, Amar N.: *See—*
Erickson, Charles E.; and Neogi, Amar N., 4,193,671, Cl. 351-160.00H.

Nerod, Irving, to American Can Company. Ultravioiet light curing apparatus for containers and the like. 4,193,204, Cl. 34-4.000.

Neumann, Gerhard M.; and Karelin, Jochen, to Delbag-Luftfilter GmbH. Method of mounting filter elements and mounting therefor. 4,193,844, Cl. 176-37.000.

Neuner, James A.; Einolf, Charles W., Jr.; and Szabo, Andras I., to Westinghouse Electric Corp. Apparatus for electrically converting an analog signal into a digital representation. 4,194,183, Cl. 340-347.0AD.

Neuray, Dieter: *See—*
Tacke, Peter; Neuray, Dieter; and Michael, Dietrich, 4,193,907, Cl. 260-37.00N.

Newton, Alan B.: *See—*
Caunt, Anthony D.; Vincent, Peter I.; and Newton, Alan B., 4,193,893, Cl. 252-429.00B.

Ng, Keng C.: *See—*
Weaver, Merle L.; and Ng, Keng C., 4,194,016, Cl. 426-419.000.

Niagara Cutter Inc.: *See—*
Oaks, Ronald R., 4,193,719, Cl. 407-49.000.

Nichols, Philip T.: *See—*
Watts, Paul J.; Crawford, Lynn D.; and Nichols, Philip T., 4,193,413, Cl. 135-2.000.

Nichols, William B. Process and apparatuses for landing aircraft on water covered landing surfaces. 4,193,569, Cl. 244-100.00R.

Nicolson, Ian T.: *See—*
Hunt, Leslie; Nicolson, Ian T.; and Whitfield, Thomas M., 4,193,752, Cl. 425-131.100.

Nicouland, Jean R.: *See—*
Melan, Giuseppe-Fabrizio M.; and Nicouland, Jean R., 4,193,557, Cl. 242-18.00A.

Nieder, Gerhard: *See—*
Rockl, Gerhard; Nieder, Gerhard; and Schulz, Hans-Holger, 4,193,646, Cl. 308-187.100.

Nielson, Jay P. Self-propelled slip form machine. 4,193,750, Cl. 425-60.000.

Niemers, Ekkehard; Wollweber, Hartmund; Kolling, Heinrich; and Thomas, Herbert, to Bayer Aktiengesellschaft. Substituted benzene-sulphonic acid esters, processes for their preparation and their use as medicaments. 4,194,004, Cl. 424-300.000.

Nieuwkamp, Johannes G. M.: *See—*
Meijer, Peter J. N.; and Nieuwkamp, Johannes G. M., 4,193,925, Cl. 260-326.5FN.

Niggemeier, Joseph F.; and Yeates, Richard P., to ACF Industries, Incorporated. Head insert for railway trailer hitch. 4,193,350, Cl. 410-64.000.

Nihon Denshi Kogyo Kabushiki Kaisha: *See—*
Kojima, Rinzo; Shibata, Kazuhiro; and Nagata, Sachio, 4,193,825, Cl. 148-16.600.

Nilsson, Erland: *See—*
Johansson, Bengt; and Nilsson, Erland, 4,194,138, Cl. 313-3.000.

Nipak, Inc.: *See—*
Spence, William M., 4,193,744, Cl. 417-567.000.

Nippon Electric Co., Ltd.: *See—*
Masaki, Masaru; and Yotsutani, Akio, 4,194,153, Cl. 455-31.000.
Yabe, Hideo; and Sato, Shohei, 4,194,090, Cl. 179-18.0ES.

Nippon Kogaku K.K.: *See—*
Hasegawa, Hiroshi; and Nakano, Kunihiro, 4,193,677, Cl. 354-127.000.
Ishibashi, Kazufumi; and Ichimura, Takeo, 4,193,807, Cl. 106-47.00Q.

Nippon Mining Co., Ltd.: *See—*
Sato, Junichi, 4,193,849, Cl. 204-38.00B.

Nippon Petrochemicals Co., Ltd.: *See—*
Murai, Yoshikazu; Tsuji, Okitsugu; and Sato, Atsushi, 4,193,764, Cl. 8-94.220.

Nissan Motor Company, Limited: *See—*
Aoyama, Syunichi, 4,193,381, Cl. 123-119.00A.
Shindo, Akio; and Mizunaga, Shinji, 4,193,427, Cl. 139-54.000.
Takahashi, Koichi; Hayakawa, Yoshikazu; and Usui, Keizaburo, 4,193,264, Cl. 60-397.000.

Nitsche, Joseph E.: *See—*
Dates, Harold F.; and Nitsche, Joseph E., 4,194,042, Cl. 428-332.000.

Nixon, Ralph D., to English Electric Valve Company Limited. Methods and apparatus for examination of surface temperature distribution. 4,193,302, Cl. 73-351.000.

Noda, Norio: *See—*
Shimada, Yoshio; Kagotani, Keiichi; Noda, Norio; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,194,065, Cl. 435-133.000.

Noe, William J., to Maytag Company, The. Belt drive system utilizing an adjustable idler mechanism. 4,193,315, Cl. 74-242.11R.

Nordenberg, Mats B.: *See—*
Bodelson, Berth I. A.; and Nordenberg, Mats B., 4,193,537, Cl. 233-20.00A.

Nordin, Bengt A. Device for transport and unloading of stacked logs. 4,193,730, Cl. 414-537.000.

Nordson Corporation: *See—*
Hamilton, William M.; Scholl, Charles H.; Kruke, Jeffrey J.; and Akers, Larry D., 4,193,745, Cl. 418-9.000.

Noren, Kjell S.; and Karlsson, Stig I., to AB Svensk Varmematning SVM. Apparatus for registering quantity values of corresponding volume or energy quantities by means of counters in a central station. 4,194,180, Cl. 340-183.000.

Noren, Robert C.; and Spritzer, Michael H., to General Atomic Company. Heating element and electrode assembly for high temperature furnaces. 4,194,079, Cl. 13-25.000.

Norland, Kenneth S.: *See—*
Bloom, Stanley M.; Hoffman, Arnold; and Norland, Kenneth S., 4,193,847, Cl. 204-15.000.

Norris, Lewis H.; and Dykes, Charles H., to Worchester Controls AG. Plug valve. 4,193,580, Cl. 251-309.000.

Northern Engineering Industries Limited: *See—*
Weston, Sidney, 4,193,510, Cl. 220-5.00A.

Northern Telecom Limited: *See—*
Boehler, Rolf, 4,193,186, Cl. 29-741.000.

Northup, Marcus A., Jr.: *See—*
Schoenholz, Daniel; Petersen, Arthur W.; and Northup, Marcus A., Jr., 4,193,886, Cl. 252-90.000.

Northwest Molded Products Corporation: *See—*
Neff, Paul C., 4,193,166, Cl. 16-121.000.

Novatronics, Inc.: *See—*
McCarty, Lewis C., Jr., 4,193,567, Cl. 244-3.160.

Novello, Renzo; and Bottussi, Elvio, to Fratelli Novello S.p.A. Template cutting device. 4,193,723, Cl. 409-122.000.

Nowlin, Oscar D.: *See—*
Dietz, Richard E.; and Nowlin, Oscar D., 4,194,076, Cl. 526-125.000.

Nozawa, Takamitsu: *See—*
Saito, Tadao; Nozawa, Takamitsu; Tsuchida, Haruo; Iizuka, Shigeo; and Goto, Takayuki, 4,193,551, Cl. 239-333.000.

Nu-Concept Computer Systems, Inc.: *See—*
Vandermark, Harold F., 4,193,160, Cl. 15-341.000.

Nutley, Hugh; and Gardner, Howard S. Method of preventing vapor explosions caused by contact of two liquids having different temperatures. 4,194,124, Cl. 250-492.00R.

Oaks, Ronald R., to Niagara Cutter Inc. Cutting tool. 4,193,719, Cl. 407-49.000.

Obata, Kenji: *See—*
Yamamoto, Ryuichi; Yamamoto, Kousuke; Nagata, Teruyuki; and Obata, Kenji, 4,193,932, Cl. 260-453.0PH.

Obenschain, Arthur W., to United States of America, Navy. Method and apparatus for reducing magnetometer errors. 4,194,150, Cl. 324-245.000.

Odoerfer, Hans F. Exterior wall composition. 4,193,240, Cl. 52-344.000.

Oesterling, Erwin: *See—*
Wahle, Gunter; Heitmann, Uwe; Oesterling, Erwin; and Dahlgrun, Rolf, 4,193,409, Cl. 131-23.00R.

Ogawa, Hiroshi: *See—*
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; and Sagara, Seiji, 4,193,483, Cl. 192-26.000.

Ogawa, Iwakichi, to Takara Co., Ltd. Combination vehicle and launcher toy assembly. 4,193,597, Cl. 273-405.000.

Ogawa, Takuzo: *See—*
Mochizuki, Yasuhiro; Hachino, Hiroaki; Yasuda, Yasumichi; Misawa, Yutaka; and Ogawa, Takuzo, 4,193,826, Cl. 148-189.000.

Ognevsky, Viktor A.: *See—*
Egorov, Viktor P.; Ognevsky, Viktor A.; Orlovsky, Anatoly G.; Ostrovsky, Grigory A.; Ryskind, Alexandr M.; Stepin, Anatoly L.; Trofimov, Oleg F.; and Shklyarov, Isaak N., 4,193,824, Cl. 148-12.400.

Ogura, Toshinobu: *See—*
Yasukuni, Mitsuo; Ogura, Toshinobu; Omaki, Takanobu; and Tanaka, Masahide, 4,193,667, Cl. 350-187.000.

Oguri, Yasuo: *See—*
Uchida, Mitsuo; Oguri, Yasuo; Saito, Junji; and Kawahara, Tsukasa, 4,193,958, Cl. 264-86.000.

Ohishi, Naoaki; Sakaida, Toshiaki; and Hasegawa, Mitsuru, to Showa Denko K. K. Method for preparing corundum particles. 4,193,768, Cl. 23-301.000.

Ohkubo, Hitoshi, to Tokyo Shibaura Electric Co., Ltd. Measuring apparatus for measuring a charging degree of liquid. 4,194,148, Cl. 324-453.000.

Ohmori, Masayuki, to Sony Corporation. Video projecting apparatus. 4,194,216, Cl. 358-60.000.

Ohnuma, Teruyuki: *See—*
Mochizuki, Manabu; Suzuki, Kohji; Oyama, Hajime; and Ohnuma, Teruyuki, 4,193,679, Cl. 355-1.000.

Okamoto, Toshihiko: *See—*
Shudo, Koichi; Okamoto, Toshihiko; Isogai, Yo; and Takahashi, Soshiro, 4,193,788, Cl. 71-94.000.

Okayama, Hirohumi, to Kato Electric and Machinery Co., Ltd. Rear hinge for holding lid of record player to console. 4,193,164, Cl. 16-141.000.

Okita, Koichi, to Sumitomo Electric Industries, Ltd. Composite structure vascular prostheses. 4,193,138, Cl. 3-1.400.

Okubo, Hachiro, to Kinki Printing Company, Ltd. Container with an internal divider. 4,193,532, Cl. 229-28.00R.

Okubo, Katsuyuki; Ueda, Nobuyasu; and Ono, Tetsumi, to Toray Industries, Inc. Sound insulating unit and sound barrier. 4,193,474, Cl. 181-287.000.

Olin Corporation: *See—*
Halverson, Henry J., 4,193,348, Cl. 102-91.000.

Olsson, Carl F. S. Method of stripping pulp bales and a machine therefor. 4,193,169, Cl. 19-80.00R.

Omaki, Takanobu: *See—*
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Thomas, Ronald, 4,193,820, Cl. 136-89.00P.

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Nanaumi, Kazuyuki; and Baba, Koji, 4,193,443, Cl. 165-66.000.

Orlovsky, Anatoly G.: *See—*
Egorov, Viktor P.; Ognevsky, Viktor A.; Orlovsky, Anatoly G.; Ostrovsky, Grigory A.; Ryskind, Alexandr M.; Stepin, Anatoly L.; Trofimov, Oleg F.; and Shklyarov, Isaak N., 4,193,824, Cl. 148-12.400.

Orlowski, Gerald J.; Wicklund, Rodney D.; Sandlas, Richard D.; and Weibler, Walter W., to Armour and Company. Apparatus for molding meat patties. 4,193,167, Cl. 17-32.000.

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Brankling, David; and Crawford, John, 4,194,057, Cl. 585-11.000.

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Langer, Teresa; Krukowska-Fulde, Barbara; and Langer, Jerzy, 4,194,141, Cl. 313-503.000.

Ostrovsky, Grigory A.: *See—*
Egorov, Viktor P.; Ognevsky, Viktor A.; Orlovsky, Anatoly G.; Ostrovsky, Grigory A.; Ryskind, Alexandr M.; Stepin, Anatoly L.; Trofimov, Oleg F.; and Shklyarov, Isaak N., 4,193,824, Cl. 148-12.400.

Otis Engineering Corporation: *See—*
Fisher, Ernest P., Jr., 4,193,450, Cl. 166-155.000.

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Overman, David C. Apparatus for inserting and removing contact lenses. 4,193,622, Cl. 294-1.0CA.

Owen, David P., to Marconi Instruments Limited. Variable frequency sources. 4,194,164, Cl. 330-130.000.

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Canfield, Sheldon A.; and Karch, Walter J., 4,194,077, Cl. 13-6.000.

Owens-Illinois, Inc.: *See—*
Mumford, Eustace H., 4,193,784, Cl. 65-69.000.

Oy. E. Sarlin Ab: *See—*
Sarvanne, Hannu, 4,193,604, Cl. 277-117.000.

Oy Tampella AB: *See—*
Aario, Matti, 4,193,865, Cl. 209-240.000.

Oyama, Hajime: *See—*
Mochizuki, Manabu; Suzuki, Kohji; Oyama, Hajime; and Ohnuma, Teruyuki, 4,193,679, Cl. 355-1.000.

Pace Incorporated: *See—*
Milne, James A., 4,193,830, Cl. 156-306.000.

Pagen, Charles A.: *See—*
Cushman, Donald R.; Pagen, Charles A.; and Schick, John W., 4,194,023, Cl. 427-138.000.

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Strunc, Gerald R., 4,193,329, Cl. 83-250.000.

Palange, Walter. Apparatus for use in producing knit fabrics. 4,193,273, Cl. 66-4.000.

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Palmer, Darrel R.: *See—*
Loveless, James C.; and Palmer, Darrel R., 4,193,400, Cl. 128-214.400.

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Esteve Bianchini, Asuncion; and Palomo Coll, Antonio L., 4,193,918, Cl. 260-239.100.

Panametrics, Inc.: *See—*
Lynnworth, Lawrence C., 4,193,291, Cl. 73-32.00A.

Pankratov, Vladimir I.; Konovalenko, Gennady P.; Prilipko, Ivan T.; and Gomberg, Moris L., to Ukrainsky Nauchno-Issledovatelsky Institut Tseljulozno-Bumazhoi Promyshlennosti (UKRNIIB). De-

vice for non-contact gauging of thickness or weight per unit area of sheet and like materials. 4,194,114, Cl. 250-308.000.

Pao, Julie: *See—*
Wilson, Peggy M.; and Pao, Julie, 4,193,452, Cl. 166-274.000.

Papineau, Milton D., to United States of America, Navy. Up-Doppler simulator. 4,194,167, Cl. 331-38.000.

Papinsick, John: *See—*
Lileck, John T.; Papinsick, John; and Steigerwalt, Edward J., 4,193,976, Cl. 423-406.000.

Par-Way Co.: *See—*
Hanson, Harold W., Jr.; and Doering, Beuford C., 4,193,373, Cl. 118-17.000.

Parcor: *See—*
Boigegrain, Robert; Gachon, Michel; Maffrand, Jean-Pierre; and Maire, Gerard, 4,193,997, Cl. 424-256.000.

Parker & Harper Mfg. Co., Inc.: *See—*
Massey, Roger G., 4,193,579, Cl. 251-288.000.

Parker, John A.: *See—*
Kourtides, Demetrius A.; and Parker, John A., 4,193,829, Cl. 156-276.000.

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Pasour, John A.; Kapetanakos, Christos A.; Mahaffey, Redge A.; and Golden, Jeffry, to United States of America, Navy. Reflex tetrode for producing an efficient unidirectional ion beam. 4,194,139, Cl. 313-153.000.

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Geissler, Udo M., 4,194,234, Cl. 362-17.000.

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Lang, Armin, 4,193,471, Cl. 180-154.000.

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Larssen, Steinar, 4,193,162, Cl. 16-2.000.

Patry, Eric; and Lelaidier, Daniel, to Saft-Societe des Accumulateurs Fixes et de Traction. Device for controlling the charging and discharging of a storage battery. 4,194,146, Cl. 320-44.000.

Patterson, Matthew, to Hughes Aircraft Company. Multiple grid fabrication method. 4,193,176, Cl. 29-25.140.

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Kessens, Norman J.; and Joray, Marvin L., 4,193,250, Cl. 56-208.000.

Pauls, Joachim: *See—*
Scholl, Gunter; and Pauls, Joachim, 4,194,060, Cl. 429-67.000.

Paulson, John K. Adjustable ball projecting device. 4,193,591, Cl. 272-78.000.

Pauly, Peter D.: *See—*
Stone, Herman; and Pauly, Peter D., 4,193,887, Cl. 252-91.000.

Pauly, Ronald R.; Good, Thomas W.; Hastings, John D.; and Ryan, Kevin D., to Tonka Corporation. Mountable wheel for toy vehicle. 4,193,639, Cl. 301-9.0DH.

Payne, Francis L.; and Godsey, Ernest E., to Burr-Brown Research Corporation. Parallel connected switching regulator system. 4,194,147, Cl. 323-17.000.

Pearson, John; and Eaton, Homer L., to Eaton-Leonard Corporation. Chuck with opposed gripping. 4,193,607, Cl. 279-1.0DC.

Pedersen, Arne M.: *See—*
Bechgaard, Helle; and Pedersen, Arne M., 4,193,985, Cl. 424-19.000.

Peichl, Rolf; and Kaulmann, Gunter, to Wilhelm Karmann GmbH. Bumpers for motor vehicles. 4,193,621, Cl. 293-142.000.

Pelfrey, Richard L.: *See—*
Lundberg, John A.; Schafer, Robert J.; Toeniskoetter, Richard H.; and Pelfrey, Richard L., 4,193,909, Cl. 260-42.150.

Pellerito, Alex. Connector apparatus for pressurized lines. 4,193,419, Cl. 137-322.000.

Pennwalt Corporation: *See—*
Cushman, Robert H., 4,194,121, Cl. 250-439.00P.

Penrose, Alexander B.: *See—*
Leeming, Michael R. G.; Narayanaswami, Subramaniyan; and Penrose, Alexander B., 4,193,994, Cl. 424-249.000.

Pentel Kabushiki Kaisha: *See—*
Abe, Kiyomi; and Takahashi, Hiromichi, 4,194,083, Cl. 178-18.000.

Perino, Didier: *See—*
Lewiner, Jacques; Dreyfus, Gerard; and Perino, Didier, 4,194,189, Cl. 340-373.000.

Permawick Company, Inc.: *See—*
Abel, Martin L., 4,193,960, Cl. 264-128.000.

Persista, Inc.: *See—*
McArthur, Alexander D.; Holsgrove, Robert J.; and Hodge, Gerard, 4,193,178, Cl. 29-129.500.

Pervushin, Evgeny S.: *See—*
Berber, Viktor A.; Pervushin, Evgeny S.; Murtazin, Khafiz M.; Kholin, Vladimir G.; and Galishnikov, Boris M., 4,193,288, Cl. 73-1.00R.

Peter, Cornelius, to Robert Bosch GmbH. Signal linearizing circuit for internal combustion engines. 4,193,300, Cl. 73-204.000.

Petersen, Arthur W.: *See—*
Schoenholz, Daniel; Petersen, Arthur W.; and Northup, Marcus A., Jr., 4,193,886, Cl. 252-90.000.

Peterson, Don G.; and Harper, Judson M., to Food Processes, Inc. Granular bed heating method. 4,193,758, Cl. 432-27.000.

Peterson, Edwin E. Rain-shielded welder's mask. 4,193,132, Cl. 2-8.000.

Peterson, William A., Jr.: *See—*
Marchak, Roman O.; and Peterson, William A., Jr., 4,193,380, Cl. 123-32.0EG.

Petroleo Brasileiro S.A.-Petrobras: *See—*
Bruening, Wilhelm; de Andrade Bruening, Inai M. R.; and Martinez Concha, Francisco J., 4,193,963, Cl. 422-52.000.

Petrolite Corporation: *See—*
Cheng, William J.; and Guthrie, David B., 4,193,769, Cl. 44-51.000.
Watkins, Leslie R., 4,193,856, Cl. 204-186.000.

Pettersson, Axel J. M.; and Johansson, Rolf K., to Saab-Scania Aktiebolag. Arrangement for a lighting unit in vehicles. 4,194,236, Cl. 362-66.000.

Pfeifer, Josef: *See—*
Muller, Jurgen; Pfeifer, Josef; Rheude, Alfred; Erckel, Rolf; Farber, Heinrich; and Zrenner, Bernhard, 4,193,682, Cl. 355-10.000.

Pfeiffer, James W., to Fairchild Camera and Instrument Corporation. Technique for applying polarizer material to liquid-crystal displays. 4,193,287, Cl. 29-593.000.

Pfeiffer, Ulrich: *See—*
Schiepe, Heinz; and Pfeiffer, Ulrich, 4,193,725, Cl. 414-83.000.

Pfizer Inc.: *See—*
Kraska, Allen R., 4,193,999, Cl. 424-267.000.
Leeming, Michael R. G.; Narayanaswami, Subramaniyan; and Penrose, Alexander B., 4,193,994, Cl. 424-249.000.
Schnur, Rodney C., 4,193,996, Cl. 424-256.000.

Phillips, Benjamin A., to Allied Chemical Corporation. Evaporation device and method with controlled refrigerant expansion and storage. 4,193,268, Cl. 62-101.000.

Phillips Petroleum Company: *See—*
Cobb, Raymond L., 4,193,924, Cl. 260-326.00C.
Dietz, Richard E.; and Selman, Charles M., 4,194,075, Cl. 526-125.000.
Dietz, Richard E.; and Nowlin, Oscar D., 4,194,076, Cl. 526-125.000.
McDaniel, Max P., 4,194,073, Cl. 526-98.000.
McKay, Dwight L., 4,193,891, Cl. 252-411.00R.
Stoller, Frederick L., 4,194,037, Cl. 428-92.000.

Piana, Renato. Covering for building structures and related installation method. 4,193,230, Cl. 52-90.000.

Piccagli, Ugo. Impermeable wall construction. 4,193,716, Cl. 405-267.000.

Picquendar, Jean-Edgar, to Thomson-CSF. Apparatus for filtering an electrical signal with a charge-coupled device. 4,194,172, Cl. 333-165.000.

Pierburg Luftfahrtgerate Union GmbH: *See—*
Holzem, Heinz; and Henning, Hans J., 4,193,299, Cl. 73-199.000.

Pierce, Kenney J., to Farah Manufacturing Company, Inc. Split waistband pants. 4,193,136, Cl. 2-237.000.

Pierrot, Francois: *See—*
Dougados, Roland; Pierrot, Francois; and Wagner, Remy, 4,193,540, Cl. 235-454.000.

Pierson, Darrell E.: *See—*
Allen, Richard C.; and Pierson, Darrell E., 4,193,207, Cl. 34-13.800.

Pietrowski, Anthony. Truck mounted roller. 4,193,710, Cl. 404-128.000.

Pilat, Michael J. Electrostatic aerosol scrubber and method of operation. 4,193,774, Cl. 55-10.000.

Pimiskern, Klaus: *See—*
Herbert, Werner; Kunz, Wunibald; and Pimiskern, Klaus, 4,193,253, Cl. 57-58.890.

Pinter, Zoltan: *See—*
Agocs, Pal; Fabian, Istvan; Gajdacsi, Andras; Nagy, Sandor; and Pinter, Zoltan, 4,193,922, Cl. 548-132.000.

Pissiotas, Georg: *See—*
Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, 4,193,790, Cl. 71-116.000.

Pitney Bowes Inc.: *See—*
Mongagnino, James G., 4,193,590, Cl. 271-119.000.

Pittman, Loyal V., to Westinghouse Electric Corp. Reversing pump eccentric member. 4,193,747, Cl. 418-32.000.

Plastic Reel Corporation of America: *See—*
McDermott, Peter; and Fattori, Lazzaro A., 4,193,497, Cl. 206-387.000.

Plastics, Inc.: *See—*
Colato, Albert E., 4,194,015, Cl. 426-233.000.

Plath, C.: *See—*
Schuster, Jurgen, 4,193,432, Cl. 114-144.00C.

Plonski, Sigfried G.: *See—*
Reekstin, John P.; Plonski, Sigfried G.; and Jones, Addison B., 4,193,687, Cl. 356-150.000.

Plotkin, Gerald N., to United States of America, Navy. Infrared fuze test simulator. 4,193,297, Cl. 73-167.000.

Plummer, William T., to Polaroid Corporation. Photographic camera. 4,193,675, Cl. 354-86.000.

Poche, John M. Pivotable bucket with a rotatable earth moving mechanism. 4,193,217, Cl. 37-93.000.

Podkletnov, Evgeny N., deceased: *See—*
Khodsky, Lev G.; Brazgovskaya, Alla I.; Kaminskaya, Valentina S.; and Podkletnov, Evgeny N., deceased, 4,193,808, Cl. 106-48.000.

Pogue, Clarence W. Sea mammal gate. 4,193,219, Cl. 43-14.000.

Pohlenz, Jack B., to UOP Inc. Treating particle-containing SOx or NOx gas streams in parallel passage contactors. 4,193,972, Cl. 423-244.000.

Poiger, Hermann; and Huster, Lienhard B., to Societe d'Assistance Technique pour Produits Nestle S.A. Flavored bouillon base. 4,194,017, Cl. 426-533.000.

Polaroid Corporation: *See—*
Bloom, Stanley M.; Hoffman, Arnold; and Norland, Kenneth S., 4,193,847, Cl. 204-15.000.
Land, Edwin H.; and Kinsman, Gordon F., 4,194,061, Cl. 429-82.000.
Plummer, William T., 4,193,675, Cl. 354-86.000.

Poly-Glas Systems: *See—*
Hetherington, Robert D.; and Goelz, David W., 4,193,546, Cl. 239-112.000.

Polysius AG: *See—*
Wurr, Jurgen; Vering, Antonius; and Ermer, Bodo, 4,193,759, Cl. 432-78.000.

Ponticello, Ignazio S.: *See—*
Frank, David S.; and Ponticello, Ignazio S., 4,194,063, Cl. 435-12.000.

Popov, Jury S.: *See—*
Vinokurov, Alexandr A.; Gorbunov, Gennady S.; Popov, Jury S.; Skachkov, Jury V.; Filippov, Iosif F.; and Khutoretsky, Gary M., 4,194,137, Cl. 310-52.000.

Portex, Inc.: *See—*
Stephens, Thomas P., 4,193,174, Cl. 24-249.00R.

Posner, Louis L.; and McGarry, Patrick J., to Thermal Economics, Inc. Auxiliary window element. 4,193,225, Cl. 49-465.000.

Potter, Blaine, to Double E Company, Inc. Core chuck. 4,193,633, Cl. 279-2.00R.

Powell, Joe A., to B. F. Goodrich Company, The. Self supporting tire. 4,193,437, Cl. 152-330.0RF.

Powlas, Jerome D.: *See—*
Vogel, Kenneth E.; and Powlas, Jerome D., 4,193,781, Cl. 62-81.000.

PPG Industries, Inc.: *See—*
Crawford, Roger A.; and Hoekje, Howard H., 4,193,851, Cl. 204-101.000.
Gillery, Frank H., 4,194,022, Cl. 427-109.000.
Mazzoni, Renato J.; Mistrick, George R.; and Rosskamp, Barent A., 4,193,236, Cl. 52-172.000.
Thomaswick, Ronald J., 4,193,736, Cl. 414-786.000.
White, Preston S., 4,193,938, Cl. 260-582.000.

Precision Cosmet Corp.: *See—*
Erickson, Charles E.; and Neogi, Amar N., 4,193,671, Cl. 351-160.00H.

Prella, Giovanni: *See—*
Invernizzi, Rutilio; and Prella, Giovanni, 4,194,011, Cl. 426-8.000.

Prescher, Kenneth A.: *See—*
Bowman, George F.; and Prescher, Kenneth A., 4,193,417, Cl. 137-192.000.

Press, Irving D., to Resistoflex Corporation. Method of forming a heat exchanger. 4,193,180, Cl. 29-157.400.

Prilipko, Ivan T.: *See—*
Pankratov, Vladimir I.; Konovalenko, Gennady P.; Prilipko, Ivan T.; and Gomberg, Moris L., 4,194,114, Cl. 250-308.000.

Prinz, Richard: *See—*
Wingler, Frank; Eicher, Theobald; Muller, Friedemann; Fischer, Winfried; and Prinz, Richard, 4,193,897, Cl. 260-17.00R.

Procter & Gamble Company: *See—*
Trindle, Dean D.; and Amneus, John S., 4,193,506, Cl. 215-11.00C.

Proiss, Ludwig, to Kilcher-Chemie AG. Method of producing an electrically conductive plastics material. 4,193,955, Cl. 264-23.000.

Propylox a Societe Anonyme: *See—*
Hildon, Anthony M.; and Greenhalgh, Peter F., 4,193,929, Cl. 260-348.250.

Prosl, Frank R.: *See—*
Tucker, Elton M.; and Prosl, Frank R., 4,193,397, Cl. 128-207.190.

Pullukat, Thomas J.; Shida, Mitsuzo; and Hoff, Raymond E., to Chemplex Company. Polymerization process. 4,194,074, Cl. 526-100.000.

Purdy, Chester A. Liquid proportioning device with insufficient supply and flow valves. 4,193,515, Cl. 222-57.000.

Purdy, Chester A.; and Purdy, George A., to Purdy Proportioners, Ltd. Liquid proportioner for mixing two liquids in a predetermined ratio. 4,193,516, Cl. 222-57.000.

Purdy, George A.: *See—*
Purdy, Chester A.; and Purdy, George A., 4,193,516, Cl. 222-57.000.

Purdy Proportioners, Ltd.: *See—*
Purdy, Chester A.; and Purdy, George A., 4,193,516, Cl. 222-57.000.

Quenzel, Hermann: *See—*
Eberlein, Helmut; Quenzel, Hermann; and Kornberger, Otto, 4,193,706, Cl. 403-19.000.

Quilici, Jean-Francois, to Renault Moteurs Developpement. Braking arrangement and brake, particularly for two-wheeled vehicles. 4,193,479, Cl. 188-2.00A.

R & G Energy Research Corporation: *See—*
Guarnaschelli, Vincent; and Reiss, Mitchell, 4,193,755, Cl. 431-207.000.

R. Perry & Company Limited: *See—*
Tyrer, Andrew C. R.; and Lace, David G., 4,193,153, Cl. 9-342.000.

R. W. Hartnett Company: *See—*
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,193,343, Cl. 101-35.000.

Rabinow, Jacob, to Hall & Myers, a part interest. Escort memory using mirrors. 4,194,126, Cl. 250-566.000.

Radway Plastics Limited: *See—*
Molyneux, George, 4,193,231, Cl. 52-97.000.

Ramsey Controls, Inc.: *See—*
Boyd, Robert L.; Hamilton, David C.; Wood, Wilmer E.; Fleming, Joseph; and Wegmann, Raymond, 4,193,444, Cl. 165-76.000.

Ramsey, Robert C., to Electro-Voice, Incorporated. Microphone shock mount and assembly. 4,194,096, Cl. 179-147.000.

Rank Xerox Limited: *See—*
Yoshikawa, Akira; and Aota, Kouichi, 4,193,680, Cl. 355-3.00R.

Rapkin, Myron C.: *See—*
Daunora, Louis G.; Lam, Charles T. W.; and Rapkin, Myron C., 4,193,766, Cl. 23-230.00R.

Rasmussen, Knud A.: *See—*
Wahrendorf, York A.; Frenzel, Herbert K.; Ambrosch, Adolf K.; Rasmussen, Knud A.; Seibert, Horst; and Dieckmann, Horst J., 4,193,718, Cl. 405-286.000.

Rath, Heinz-Jorg: *See—*
Sirtl, Erhard; and Rath, Heinz-Jorg, 4,194,028, Cl. 427-249.000.

Rauterkus, Karl J.: *See—*
Mondt, Josef; Rauterkus, Karl J.; and Rinno, Helmut, 4,193,902, Cl. 260-29.6TA.

Ravez, Paul: *See—*
Dondeyne, Alban; Marchasson, Maurice; Ravez, Paul; and Soubrier, Louis, 4,193,355, Cl. 110-336.000.

Ray, Donald R.: *See—*
Steddum, Riddle E.; Ray, Donald R.; and Crager, Bruce L., 4,193,455, Cl. 166-359.000.

Raychem Corporation: *See—*
Campbell, Bruce D., 4,194,082, Cl. 174-74.00A.

Raytheon Company: *See—*
Watkins, Robert A., 4,193,688, Cl. 356-152.000.

RCA Corporation: *See—*
Fjarlie, Earl J., 4,193,691, Cl. 356-330.000.
Hartmann, John C.; and Maxemchuk, Nicholas F., 4,194,184, Cl. 340-347.00P.

Read, Martin A.: *See—*
Cullingford, Christopher V.; and Read, Martin A., 4,193,965, Cl. 422-95.000.

Rebers, Gunter: *See—*
Koch, Freidrich; Ludwig, Ralf; Gunther, Herbert; and Rebers, Gunter, 4,193,701, Cl. 366-159.000.

Redactron Corporation: *See—*
Marino, Francis C.; and Herman, Morton B., 4,194,188, Cl. 340-365.00E.
Marino, Francis C., 4,194,223, Cl. 360-41.000.

Redfern, John T., to United States of America, Navy. Piezoelectric vibration detector for sensing a nearby intruder. 4,194,194, Cl. 340-566.000.

Redlich, Horst, to Ted Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec. Device for mechanically recording a signal having a bandwidth of several MHz, particularly for a video disc. 4,194,094, Cl. 179-100.41P.

Reekstin, John P.; Plonski, Sigfried G.; and Jones, Addison B., to Rockwell International Corporation. High resolution alignment technique and apparatus. 4,193,687, Cl. 356-150.000.

Refson, Bernard H., to Watson-Marlow Limited. Fluid displacement. 4,193,398, Cl. 128-213.00R.

Regie Nationale des Usines Renault: *See—*
de la Riviere, Francois-Xavier J., 4,193,777, Cl. 55-96.000.

Rehacek, Josef; and Dasek, Jaroslav, to Societe d'Assistance Technique pour Produits Nestle S.A. Methionine-containing microgranulates and method of manufacture. 4,194,013, Cl. 426-96.000.

Rehacek, Josef: *See—*
Hodel, Theodore; Buhler, Marcel; and Rehacek, Josef, 4,194,018, Cl. 426-580.000.

Reid, Walter L., Jr.; Delano, Ralph L.; and Jepson, John W., to Acushnet Company. Separate component construction wood type golf club. 4,193,601, Cl. 273-167.00R.

Reinecke, Erich, to WABCO Westinghouse GmbH. Brake valve. 4,193,641, Cl. 303-50.000.

Reinschmidt, Robert M.: *See—*
Mrazek, Dale A.; and Reinschmidt, Robert M., 4,194,131, Cl. 307-209.000.

Reischl, Artur; Hombach, Rudolf; and Dollhausen, Manfred, to Bayer Aktiengesellschaft. Method for making bonds. 4,193,832, Cl. 156-331.000.

Reiss, Mitchell: *See—*
Guarnaschelli, Vincent; and Reiss, Mitchell, 4,193,755, Cl. 431-207.000.

Renault Moteurs Developpement: *See—*
Quilici, Jean-Francois, 4,193,479, Cl. 188-2.00A.

Reneau, Raymond W.: *See—*
Faris, Ted V.; and French, Sanford W., IV, 4,193,411, Cl. 131-171.00R.

Repke, Virginia L.; and Shepherd, Robert C., to Johnson & Johnson. Stretchable and conformable pad. 4,193,404, Cl. 128-280.000.

Resistoflex Corporation: *See—*
Press, Irving D., 4,193,180, Cl. 29-157.400.

Reusch, Michael F.: *See—*
Jayaram, Krishnaswamy; and Reusch, Michael F., 4,194,239, Cl. 363-109.000.

Rexnord Inc.: *See—*
Dumbeck, Robert F., 4,194,129, Cl. 307-149.000.
Dumbeck, Robert F., 4,194,178, Cl. 340-201.00R.

Riddle, Charles F.; and Ritchey, Paul E., 4,193,468, Cl. 180-89.170.
Reymond, Gilbert: *See—*
Hengartner, Urs; Reymond, Gilbert; and Toome, Valdemar, 4,193,850, Cl. 204-79.000.
Reymond, Jean-Claude; and Hidalgo, Jean-Luc, to Thomson-CSF. Arrangement for locating radiaring sources. 4,193,689, Cl. 356-152.000.
Reynolds, Jack H., to NCR Corporation. Constant velocity driving means. 4,194,144, Cl. 318-341.000.
Reynolds Metals Company: *See—*
Weston, David, 4,193,791, Cl. 75-2.000.
Rhee, Jhoon G. Protective device for the hand. 4,193,135, Cl. 2-162.000.
Rheude, Alfred: *See—*
Muller, Jurgen; Pfeifer, Josef; Rheude, Alfred; Erckel, Rolf; Farber, Heinrich; and Zrenner, Bernhard, 4,193,682, Cl. 355-10.000.
Rhodia AG: *See—*
Heim, Ernst; Imbery, Dieter; and Kliemann, Bruno, 4,193,412, Cl. 131-264.000.
Rhoton, Albert L.: *See—*
Goodale, Clark W.; Morgan, Charles W.; Rhoton, Albert L.; and McNeil, David F., 4,194,026, Cl. 427-244.000.
Rich, Joseph W.; and Bergman, Richard C., to Calspan Corporation. Molecular laser operating on fundamental and overtone bands. 4,194,169, Cl. 331-94.50G.
Richards Manufacturing Company, Inc.: *See—*
Treace, Harry T., 4,193,140, Cl. 3-1.911.
Richardson, Charles B. Music synthesizing circuit. 4,193,332, Cl. 84-1.010.
Richardson, Kenneth J., to Crystaloid Electronics Company. Liquid crystal device for direct display of analog information. 4,193,669, Cl. 350-334.000.
Richter, Hans H., to Marshall and Williams Company. Method of operating a tentering clip. 4,193,175, Cl. 26-94.000.
Ricoh Company, Ltd.: *See—*
Mochizuki, Manabu; Suzuki, Kohji; Oyama, Hajime; and Ohnuma, Teruyuki, 4,193,679, Cl. 355-1.000.
Riddle, Charles F.; and Ritchey, Paul E., to Rexnord Inc. Combination vehicle underpan and maintenance platform. 4,193,468, Cl. 180-89.170.
Rider, Robert L., to United States of America, Energy. Annular flow diverter valve. 4,193,422, Cl. 137-625.490.
Rijnders, Roderick F. R. T., to International B.F. Goodrich-Europe B.V. Floating fender. 4,194,034, Cl. 428-36.000.
Rinaldo, James D.: *See—*
Bubula, Thomas J.; Franz, Maurice F.; Johnson, Gordon W.; and Rinaldo, James D., 4,193,323, Cl. 74-733.000.
Ringel, Helmut: *See—*
Langen, Hans; Ringel, Helmut; and Zimmer, Erich, 4,193,953, Cl. 264-0.500.
Rinio, Johannes A.; and Tanson, Rodolphe F., to Greifzug Gesellschaft fur Hebezeugbau m.b.H. Driving pulley mechanism. 4,193,311, Cl. 74-230.500.
Rinno, Helmut: *See—*
Mondt, Josef; Rauterkus, Karl J.; and Rinno, Helmut, 4,193,902, Cl. 260-29.6TA.
Rioux, Philip J.: *See—*
Gill, Gerald L., Jr.; and Rioux, Philip J., 4,193,226, Cl. 51-124.00R.
Ritchey, Paul E.: *See—*
Riddle, Charles F.; and Ritchey, Paul E., 4,193,468, Cl. 180-89.170.
Ritter, Franz, to BBC Brown Boveri & Company Limited. Method for monitoring the run-up to speed of asynchronous motors and apparatus for the performance thereof. 4,194,145, Cl. 318-799.000.
Riusech, Sergio. Flow control valve for subsurface irrigation system. 4,193,711, Cl. 405-39.000.
Rizzo, Salvatore P.: *See—*
Boulanger, Henry J.; and Rizzo, Salvatore P., 4,193,181, Cl. 29-509.000.
Robbins, Betty B.: *See—*
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Robbins Company, The: *See—*
Spencer, Barry A., 4,193,637, Cl. 299-56.000.
Robbins, Robert, to Cotts, Patricia Ann; Hamburger, Nancy Fern; Robbins, Betty B.; and Robbins, William Norman. Method and system for determining interest rates. 4,194,242, Cl. 364-200.000.
Robbins, William Norman: *See—*
Robbins, Robert, 4,194,242, Cl. 364-200.000.
Robert Bosch GmbH: *See—*
Heinlein, Werner, 4,194,235, Cl. 362-38.000.
Peter, Cornelius, 4,193,300, Cl. 73-204.000.
Steiner, Josef; and Michel, Friedbert, 4,193,384, Cl. 123-179.00L.
Timmermann, Christian, 4,193,663, Cl. 350-96.180.
Roberts, John S., to Kling-Tecs, Inc. Method of extruding polypropylene yarn. 4,193,961, Cl. 264-176.00F.
Roberts, John S., to Kling-Tecs, Inc. Melt spinning process. 4,193,962, Cl. 264-178.00F.
Robertshaw Controls Company: *See—*
Branson, Charles D.; and Shopsky, Harvey J., 4,194,102, Cl. 200-67.00D.
Merrell, Kenneth C.; and Koegel, James H., 4,194,195, Cl. 340-661.000.
Smith, William N., 4,194,103, Cl. 2C0-67.00E.
Robinson, Thomas P., to Travenol Laboratories, Inc. Self venting plug for venous entry unit. 4,193,399, Cl. 128-214.400.
Rockl, Gerhard; Nieder, Gerhard; and Schulz, Hans-Holger, to Teldix GmbH. Flywheel with spring loaded bearing. 4,193,646, Cl. 308-187.100.
Rockwell International Corporation: *See—*
Jones, Addison B.; and Wittry, David B., 4,194,233, Cl. 361-233.000.
Reekstin, John P.; Plonski, Sigfried G.; and Jones, Addison B., 4,193,687, Cl. 356-150.000.
Siniscal, Paul, 4,193,489, Cl. 198-406.000.
Wittry, David B., 4,194,123, Cl. 250-492.00A.
Rockwool Aktiebolaget: *See—*
Cederqvist, Gunnar; and Aberg, Ulf, 4,193,841, Cl. 162-152.000.
Rogers, David W., to General Motors Corporation. Vacuum operated valve arrangement. 4,193,383, Cl. 123-136.000.
Rohm and Haas Company: *See—*
Lewis, Sheldon N.; and Levy, Jerome F., 4,194,052, Cl. 560-155.000.
Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, to Ishihara Sangyo Kabushiki Kaisha Ltd. Novel herbicidally active, nuclear-substituted phenoxy-phenoxy-alkanecarboxylic acid derivatives and use thereof for controlling grass-like weeds. 4,193,790, Cl. 71-116.000.
Rohrbach, Ronald P.; and Levy, Joseph, to UOP Inc. Preparation of support matrices for immobilized enzymes. 4,193,910, Cl. 260-42.430.
Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See—*
Schoneberger, Edgar F.; and Dorn, Alfred, 4,193,345, Cl. 101-365.000.
Rollason, William I. M.: *See—*
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Rolls-Royce Limited: *See—*
Briggs, Henry R., 4,193,741, Cl. 416-170.00R.
Carlisle, Denis R.; and Grun, Andrew R., 4,193,260, Cl. 60-737.000.
Lucey, Desmond C., 4,193,739, Cl. 415-118.000.
Snell, Leonard S., 4,193,262, Cl. 60-261.000.
Roma, Pierpaolo: *See—*
Bertelli, Guido; Roma, Pierpaolo; and Locatelli, Renato, 4,193,945, Cl. 525-2.000.
Ronning Engineering Company, Inc.: *See—*
Ronning, Richard L., 4,193,208, Cl. 34-131.000.
Ronning, Richard L., to Ronning Engineering Company, Inc. Single pass alfalfa dehydrator dryer and flighting therefor. 4,193,208, Cl. 34-131.000.
Roob, Josef: *See—*
Blaschke, Kurt; and Roob, Josef, 4,193,462, Cl. 175-292.000.
Rosenberg, Ralf H. S.; and Ferm, Morgan H. O., to Ifo Sanitar AB. Rest room, especially for disabled persons. 4,193,141, Cl. 4-1.000.
Rosmarinofski, Donald D. Two-wheeled vehicle carrier. 4,193,526, Cl. 224-273.000.
Rossi, Jean-Francois. Spear gun. 4,193,386, Cl. 124-22.000.
Rosskamp, Barent A.: *See—*
Mazzoni, Renato J.; Mistrick, George R.; and Rosskamp, Barent A., 4,193,236, Cl. 52-172.000.
Roth, Martin: *See—*
Baumann, Marcus; Kvita, Vratislav; Roth, Martin; and Waterhouse, John S., 4,193,927, Cl. 260-326.260.
Rowell, William J.: *See—*
Cranston, Albert W.; and Rowell, William J., 4,193,627, Cl. 294-82.00R.
Rowling, Sidney, to Spot-O-Gold Corporation. Multiple booklet and method of making the same. 4,193,498, Cl. 206-494.000.
Rowsell, David G.: *See—*
Watson, Hugh R.; Rowsell, David G.; and Spring, David J., 4,193,936, Cl. 260-557.00R.
Rudaz, Albi; and Ferrari, Albert, to Secheron Soudure S.A. Methods and devices for cutting, eroding, welding and depositing metallic and non-metallic materials by means of an electric arc. 4,194,106, Cl. 219-123.000.
Rudy, Michael W.; Kramer, Edward J.; Bondar, Martin M.; and Whitney, Ronald L., to Terminal Data Corporation. Fixed message carrier. 4,193,685, Cl. 355-41.000.
Ruegger, Edgar, to Gebruder Buhler AG. Roll mill for feeding material to the roll gap. 4,193,555, Cl. 241-37.000.
Ruehl, William E.: *See—*
Boyer, David C.; Danko, Arthur J.; and Ruehl, William E., 4,193,310, Cl. 74-230.300.
Rumpler, Jean-Jacques. Bottle stopper and method of using said stopper. 4,193,402, Cl. 128-272.000.
Ruscoe, Colin N. E.; Alner, Henry G. H.; and Baldwin, Brian C., to Imperial Chemical Industries Limited. Synergistic insecticidal compositions. 4,194,001, Cl. 424-273.00R.
Rush, Charlie D. Transparent radiation penetrable stretcher panel. 4,193,148, Cl. 5-86.000.
Rushing, John C. Method and apparatus for cleaning paper making felt. 4,193,842, Cl. 162-199.000.
Russell, B. Carson. Furniture unit. 4,193,632, Cl. 297-446.000.
Rutishauser, Albert. Transport device for a border-perforated strip-like web of data recording material. 4,193,527, Cl. 226-74.000.
Ryan, Kevin D.: *See—*
Pauly, Ronald R.; Good, Thomas W.; Hastings, John D.; and Ryan, Kevin D., 4,193,639, Cl. 301-9.0DH.
Ryskind, Alexandr M.: *See—*
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S.A.M.P.R.E. S.p.A.: *See—*
Fusaroli, Goffredo, 4,193,254, Cl. 57-105.000.

Saab-Scania Aktiebolag: *See*—
Pettersson, Axel J. M.; and Johansson, Rolf K., 4,194,236, Cl. 362-66.000.
Saby, Marc. Packing for eggs. 4,193,531, Cl. 229-2.5EC.
Sacher, Eric: *See*—
Fulks, Robert G.; Enfield, Robert E.; and Sacher, Eric, 4,194,113, Cl. 371-20.000.
Saft-Societe des Accumulateurs Fixes et de Traction: *See*—
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Sagara, Seiji: *See*—
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; and Sagara, Seiji, 4,193,483, Cl. 192-26.000.
Saint-Gobain Industries: *See*—
Melan, Giuseppe-Fabrizio M.; and Nicouland, Jean R., 4,193,557, Cl. 242-18.00A.
Saito, Junji: *See*—
Uchida, Mitsuo; Oguri, Yasuo; Saito, Junji; and Kawahara, Tsukasa, 4,193,958, Cl. 264-86.000.
Saito, Mitsuru: *See*—
Ueda, Hiroshi; Saito, Mitsuru; Nanba, Yasuhiro; and Kuramoto, Yoshio, 4,193,676, Cl. 354-106.000.
Saito, Tadao; Nozawa, Takamitsu; Tsuchida, Haruo; Iizuka, Shigeo; and Goto, Takayuki, to Yoshino Kogyosho Co., Ltd. Manually operable atomizer. 4,193,551, Cl. 239-333.000.
Saito, Toshihisa: *See*—
Ishiguro, Yasuo; Wakazono, Kenji; and Saito, Toshihisa, 4,193,673, Cl. 354-23.00D.
Saito, Yoshio: *See*—
Yasumatsu, Mutsuo; Katayama, Kenji; Takeuchi, Shozo; and Saito, Yoshio, 4,194,019, Cl. 426-580.000.
Sakabe, Nobuyuki, to Shin-Shirasuna Electric Corp. FM tuner. 4,194,156, Cl. 455-214.000.
Sakai, Kazumasa; and Watanuki, Hiroshi, to Trio Kabushiki Kaisha. Differential amplifier with a current mirror circuit. 4,194,166, Cl. 330-257.000.
Sakaida, Kaku, to Trio Kabushiki Kaisha. Control circuit and FM stereo receiver using same. 4,194,087, Cl. 179-1.0GD.
Sakaida, Toshiaki: *See*—
Ohishi, Naoaki; Sakaida, Toshiaki; and Hasegawa, Mitsuru, 4,193,768, Cl. 23-301.000.
Sakakibara, Naoji; and Hashimoto, Nobuyuki, to Aisin Seiki Kabushiki Kaisha. Electromagnetically operated valve unit. 4,193,421, Cl. 137-625.330.
Sakmann, Walter, to International Business Machines Corporation. Matrix printer with piezoelectrically driven printing needles. 4,193,703, Cl. 400-124.000.
Sakura Color Products Corporation: *See*—
Hatanaka, Akio, 4,193,906, Cl. 260-31.20R.
Salem, Robert J., to General Electric Company. Smoke simulating test apparatus for smoke detectors. 4,194,191, Cl. 340-515.000.
Salminen, Reijo K. Sailing boat and method of operating the same. 4,193,366, Cl. 114-39.000.
Samuelsson, Sture L. Building block and module system for house building. 4,193,244, Cl. 52-582.000.
Sandberg, Carl-Olof: *See*—
Bjorklund, Fritz L. G.; Sandberg, Carl-Olof; Sternbeck, Olaf; and Wern, Lars A., 4,194,134, Cl. 307-255.000.
Sanders Associates, Inc.: *See*—
Baer, Ralph H.; and Cope, Leonard D., 4,194,198, Cl. 340-724.000.
Sandhu, Mohammad A.; and Tingler, Kenneth L., to Eastman Kodak Company. Amorphous polyester adhesives for photographic materials comprising phthalic acid, linear and branched aliphatic glycol components. 4,193,803, Cl. 430-627.000.
Sandlas, Richard D.: *See*—
Orlowski, Gerald J.; Wicklund, Rodney D.; Sandlas, Richard D.; and Weibler, Walter W., 4,193,167, Cl. 17-32.000.
Sandoz, Inc.: *See*—
Kathawala, Faizulla G., 4,194,002, Cl. 424-274.000.
Sandoz Ltd.: *See*—
Mauric, Claudine; and Wolf, Rainer, 4,193,805, Cl. 106-18.150.
Sano, Takezo; and Inoue, Tadanori, to Sumitomo Chemical Company, Limited. Process for producing printing resin plates using liquid photosensitive resins. 4,193,798, Cl. 430-300.000.
Sanyo Electric Company, Ltd.: *See*—
Masaki, Takaaki, 4,194,238, Cl. 363-17.000.
Sarson, Charles R.; and Acker, Richard C., to Dana Corporation. Quick connect fitting. 4,193,616, Cl. 285-39.000.
Sarvanne, Hannu, to Oy. E. Sarlin Ab. Means for carrying a cable through a wall. 4,193,604, Cl. 277-117.000.
Sasaki, Tadao, to Sony Corporation. Electronic tuning system. 4,194,159, Cl. 455-179.000.
Sato, Atsushi: *See*—
Murai, Yoshikazu; Tsuji, Okitsugu; and Sato, Atsushi, 4,193,764, Cl. 8-94.220.
Sato, Hiroo: *See*—
Katsumata, Mitsuo; Sato, Hiroo; Ikeda, Yoshihiko; and Fujita, Tomikazu, 4,193,385, Cl. 123-198.0DC.
Sato, Junichi, to Nippon Mining Co., Ltd. Method for making a raw board for use in printed circuits. 4,193,849, Cl. 204-38.00B.
Sato, Shohei: *See*—
Yabe, Hideo; and Sato, Shohei, 4,194,090, Cl. 179-18.0ES.
Sato, Tomotaro: *See*—
Kaetsu, Isao; Watanabe, Hiroshi; Sato, Tomotaro; and Ito, Akihiko, 4,193,845, Cl. 435-182.000.
Satterberg, Lars H.; and Eliasson, Hans, to Jonsereds AB. Arrangement in a hydraulically operated crane. 4,193,505, Cl. 212-55.000.
Sauers, Marvin E., to Union Carbide Corporation. Phenolic resins and molding compositions for use in warm runner injection molding. 4,194,071, Cl. 525-480.000.
Saurenman, Donald G.: *See*—
Cumming, James M.; and Saurenman, Donald G., 4,194,232, Cl. 361-213.000.
Savor, Dennis E.; and Hales, James W., to Combustion Engineering, Inc. Work table for a stepped platform. 4,193,735, Cl. 414-744.000.
Scaringe, Robert P. Variable capacity thermal storage system employing thermal switching. 4,193,441, Cl. 165-32.000.
Scelzi, Joseph I. Finger keyer for code transmission. 4,194,085, Cl. 178-101.000.
Schafer, Robert J.: *See*—
Lundberg, John A.; Schafer, Robert J.; Toeniskoetter, Richard H.; and Pelfrey, Richard L., 4,193,909, Cl. 260-42.150.
Schafer, Walter: *See*—
Baatz, Gunther; Schafer, Walter; and Dahm, Manfred, 4,193,889, Cl. 252-316.000.
Scheidweiler, A. Lee, to Energy Vent, Inc. Damper latch. 4,193,541, Cl. 236-1.00G.
Scheidweiler, Andreas: *See*—
Meier, Otto; and Scheidweiler, Andreas, 4,194,120, Cl. 250-381.000.
Schering Aktiengesellschaft: *See*—
Junghans, Klaus, 4,194,046, Cl. 546-259.000.
Schmiechen, Ralph; Horowski, Reinhard; Palenschat, Dieter; Paschelke, Gert; Wachtel, Helmut; and Kehr, Wolfgang, 4,193,926, Cl. 260-326.50S.
Schick, John W.: *See*—
Cushman, Donald R.; Pagen, Charles A.; and Schick, John W., 4,194,023, Cl. 427-138.000.
Schiefer, Erwin; and Lang, Gusztav, to Hilti Aktiengesellschaft. Clamping member for an adhesively secured anchor rod. 4,193,246, Cl. 52-698.000.
Schiepe, Heinz; and Pfeiffer, Ulrich, to Heinz Schiepe, Grosshandel und Generalvertretung fur Holzbearbeitungsmaschinen, Firma. Stacking device for rod-like or board-shaped goods. 4,193,725, Cl. 414-83.000.
Schindler, Rudolf A.: *See*—
United States of America, National Aeronautics and Space Administration; and Schindler, Rudolf A., 4,193,693, Cl. 356-346.000.
Schlager, Kenneth J., to International Bio-Medical Industries. Diagnostic apparatus. 4,193,393, Cl. 128-710.000.
Schmidt, Walter, to Swiss Aluminium Ltd. Process and device for checking substrate wafers. 4,194,127, Cl. 250-572.000.
Schmidt, Werner; and Minke, Rudeger, to Dynamit Nobel Aktiengesellschaft. Preparation of high-viscosity mixtures containing thermoplastic polyesters. 4,193,912, Cl. 260-45.75B.
Schmiechen, Ralph; Horowski, Reinhard; Palenschat, Dieter; Paschelke, Gert; Wachtel, Helmut; and Kehr, Wolfgang, to Schering Aktiengesellschaft. 4-(Polyalkoxy phenyl)-2-pyrrolidones. 4,193,926, Cl. 260-326.50S.
Schmiegel, Klaus K.: *See*—
Molloy, Bryan B.; and Schmiegel, Klaus K., 4,194,009, Cl. 424-330.000.
Schnur, Rodney C., to Pfizer Inc. Spiro-quinolone hydantoins. 4,193,996, Cl. 424-256.000.
Schoell, Harry L. Planing boat hull. 4,193,370, Cl. 114-291.000.
Schoenholz, Daniel; Petersen, Arthur W.; and Northup, Marcus A., Jr., to Church & Dwight Co., Inc. Novel low temperature cleaner. 4,193,886, Cl. 252-90.000.
Scholl, Charles H.: *See*—
Hamilton, William M.; Scholl, Charles H.; Kruke, Jeffrey J.; and Akers, Larry D., 4,193,745, Cl. 418-9.000.
Scholl, Gunter; and Pauls, Joachim. Electric accumulator and storage cell. 4,194,060, Cl. 429-67.000.
Scholten, Joseph J. F.: *See*—
Gerritsen, Leendert A.; and Scholten, Joseph J. F., 4,193,942, Cl. 260-604.0HF.
Schoneberger, Edgar F.; and Dorn, Alfred, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Device for adjustment of the ink flow on printing press inking units. 4,193,345, Cl. 101-365.000.
Schramm, Jurgen: *See*—
Sirrenberg, Wilhelm; Klauke, Erich; Schramm, Jurgen; Hammann, Ingeborg; and Stendel, Wilhelm, 4,194,005, Cl. 424-304.000.
Schreiber, Sidney P.: *See*—
Harper, Robert J., Jr.; Calamari, Timothy A., Jr.; and Schreiber, Sidney P., 4,194,032, Cl. 427-341.000.
Schrick, Gerd H.: *See*—
Tsui, James B. Y.; and Schrick, Gerd H., 4,194,206, Cl. 343-18.00E.
Schulman, Kenneth B., to Millen Industries, Inc. Box construction. 4,193,533, Cl. 229-34.00R.
Schulz, Hans-Holger: *See*—
Rockl, Gerhard; Nieder, Gerhard; and Schulz, Hans-Holger, 4,193,646, Cl. 308-187.100.
Schuster, Hubert: *See*—
Klebe, Hans; Knippschild, Gerd; and Schuster, Hubert, 4,194,025, Cl. 427-215.000.
Schuster, Jurgen, to Plath, C. Self-steering apparatus for ships. 4,193,432, Cl. 114-144.00C.
Schwarz, Gerhard, to Compur-Electronic Gesellschaft mit beschrankter Haftung. Apparatus for separating and measuring sample components. 4,193,538, Cl. 233-26.000.
Schwauss, Waldemar B. Parlor game. 4,193,594, Cl. 273-1.00R.

Scott, Fredric W.: *See*—
Appel, Max J. G.; Carmichael, Leland E.; and Scott, Fredric W., 4,193,990, Cl. 424-89.000.
Scott, Jack D. Refrigeration system with compressor load transfer means. 4,193,270, Cl. 62-175.000.
Scott, Robert G., to American Cleaning Equipment Corporation of Illinois. Vacuum apparatus with tilting container. 4,193,161, Cl. 15-352.000.
Scott, Thomas G.: *See*—
Sustek, Alvin J., Jr.; and Scott, Thomas G., 4,193,290, Cl. 73-29.000.
Scott, Victor J., to Leigh Products, Inc. By-pass door assembly. 4,193,500, Cl. 206-577.000.
Scott, William A.: *See*—
Charmley, Richard P.; and Scott, William A., 4,193,948, Cl. 261-65.000.
Sebestyen, Gyula: *See*—
Szantay, Csaba; Szabo, Lajos; Toth, Istvan; Kanyo, Erzsebet; Sebestyen, Gyula; and Virag, Sandor, 4,193,998, Cl. 424-258.000.
Secheron Soudure S.A.: *See*—
Rudaz, Albi; and Ferrari, Albert, 4,194,106, Cl. 219-123.000.
Sefton, Verner B.; Swinkels, Godefridus M.; Kirby, Charles R.; and Genik-Sas-Berezowsky, Roman M., to Cominco Ltd.; and Sherritt Gordon Mines Limited. Process for the precipitation of iron as jarosite. 4,193,970, Cl. 423-141.000.
Seger, Ronald G.: *See*—
Trombley, Wayne E.; and Seger, Ronald G., 4,193,672, Cl. 351-160.00R.
Seibert, Horst: *See*—
Wahrendorf, York A.; Frenzel, Herbert K.; Ambrosch, Adolf K.; Rasmussen, Knud A.; Seibert, Horst; and Dieckmann, Horst J., 4,193,718, Cl. 405-286.000.
Seibold, Charles R., Jr. Closeable pillow, tote bag and the like. 4,193,152, Cl. 5-490.000.
Sekiguchi, Yoji, to Katsura Machine Co., Ltd. Vibrating apparatus for forming concrete blocks. 4,193,754, Cl. 425-424.000.
Sekiya, Fukuo: *See*—
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,193,255, Cl. 368-34.000.
Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Copolymerization in water soluble polyol with controlled reaction with the polyol and aqueous coatings containing the resulting copolymer solution. 4,193,904, Cl. 260-29.60H.
Selman, Charles M.: *See*—
Dietz, Richard E.; and Selman, Charles M., 4,194,075, Cl. 526-125.000.
Servo Products Company: *See*—
Whiteley, Glenn R.; and Bent, Michael F., 4,193,199, Cl. 33-1.0PT.
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Sharland, Stanley G.; and Mecca, Angelo R., to Lightfoot, Douglas M. Floor protecting door painting shield. 4,193,375, Cl. 118-504.000.
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Shen, Kuo-Cheng, to Canadian Patents & Development Ltd. Binding lignocellulosic materials. 4,193,814, Cl. 106-123.0LC.
Shepherd, Brian; and Thomas, Richard N., to Smiths Industries Limited. Display apparatus. 4,194,199, Cl. 340-754.000.
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Sherman, Michael I., to Kamyr, Inc. Flow control method and apparatus for continuous wood chip digester screenless liquor extractor. 4,193,839, Cl. 162-19.000.
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Shindo, Akio; and Mizunaga, Shinji, to Nissan Motor Company, Limited. Selvage forming system of shuttleless loom. 4,193,427, Cl. 139-54.000.
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Shudo, Koichi; Okamoto, Toshihiko; Isogai, Yo; and Takahashi, Soshiro. N-(2-Chloro-4-pyridyl)ureas. 4,193,788, Cl. 71-94.000.
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Sirrenberg, Wilhelm; Klauke, Erich; Schramm, Jurgen; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating arthropods with 4-cyano-4'-[N-(N'-substituted-benzoyl)-ureido]-diphenyl ethers. 4,194,005, Cl. 424-304.000.

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Slusarczuk, George M. J.; and Brooks, Ronald E., to General Electric Company. Ferrite flocculating system. 4,193,866, Cl. 210-6.000.
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Spencer, Barry A., to Robbins Company, The. Rotary cutterhead for an earth boring machine. 4,193,637, Cl. 299-56.000.
Spengler, Ernst, to Stanztechnik GmbH R & S. Apparatus for handling of flat goods. 4,193,726, Cl. 414-114.000.
Speranza, George P.; and Zimmerman, Robert L., to Texaco Development Corporation. Urea derivative and use as polyurethane catalyst. 4,194,069, Cl. 521-129.000.
Speronello, Barry K., to Engelhard Minerals & Chemicals Corporation. Beta alumina manufacture. 4,193,954, Cl. 264-13.000.
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Stanley, Carl F. Water aerating device. 4,193,951, Cl. 261-91.000.
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Steddum, Riddle E.; Ray, Donald R.; and Crager, Bruce L., to Chevron Research Company. Split stack blowout prevention system. 4,193,455, Cl. 166-359.000.
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Stier, Otto; and Vollmer, Udo, to Vollmer Werke, Maschinenfabrik GmbH. Caseless ammunition. 4,193,347, Cl. 102-38.0CC.
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Stoffel, James C., to Xerox Corporation. Automatic multimode continuous halftone line copy reproduction. 4,194,221, Cl. 358-283.000.
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Stoller, Frederick L., to Phillips Petroleum Company. Flame-resistant fabric and method of forming same. 4,194,037, Cl. 428-92.000.
Stone, Herman; and Pauly, Peter D., to Tenneco Chemicals, Inc. Filled detergent foam made by a one shot process. 4,193,887, Cl. 252-91.000.
Stonehill, Bernard C.: *See—*
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Sweet, Robert P.; and Stember, Daniel L., to D B Industries, Inc. Rigid rail safety device. 4,193,475, Cl. 182-8.000.
Swinkels, Godefridus M.: *See—*
Sefton, Verner B.; Swinkels, Godefridus M.; Kirby, Charles R.; and Genik-Sas-Berezowsky, Roman M., 4,193,970, Cl. 423-141.000.
Swiss Aluminium Ltd.: *See—*
Baur, Rudolf, 4,193,881, Cl. 252-17.000.
Schmidt, Walter, 4,194,127, Cl. 250-572.000.
Severus-Laubenteid, Harald, 4,193,848, Cl. 204-28.000.
Sy, Angel: *See—*
Tsao, Utah; and Sy, Angel, 4,193,944, Cl. 260-659.00R.
Syva Company: *See—*
Ullman, Edwin F.; and Brinkley, John M., 4,193,983, Cl. 424-12.000.
Szabo, Andras I.: *See—*
Neuner, James A.; Einolf, Charles W., Jr.; and Szabo, Andras I., 4,194,183, Cl. 340-347.0AD.
Szabo, Lajos: *See—*
Szantay, Csaba; Szabo, Lajos; Toth, Istvan; Kanyo, Erzsebet; Sebestyen, Gyula; and Virag, Sandor, 4,193,998, Cl. 424-258.000.
Szantay, Csaba; Szabo, Lajos; Toth, Istvan; Kanyo, Erzsebet; Sebestyen, Gyula; and Virag, Sandor, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT. 1,2,3,4,6,7-Hexahydro-11BαH-benzo[a]quinolizine-derivatives. 4,193,998, Cl. 424-258.000.
T & F Industries, Inc.: *See—*
Frandsen, Warren E., 4,193,313, Cl. 74-231.00P.
Taber, Gilbert L. Apparatus for manual manipulation of articles. 4,193,511, Cl. 221-66.000.
Tacke, Peter; Neuray, Dieter; and Michael, Dietrich, to Bayer Aktiengesellschaft. Flame proof polyamide moulding compositions. 4,193,907, Cl. 260-37.00N.
Tackett, DeForest. Hydraulic drive for lawn clipping vacuum collector. 4,193,249, Cl. 56-11.900.
Takahashi, Hiromichi: *See—*
Abe, Kiyomi; and Takahashi, Hiromichi, 4,194,083, Cl. 178-18.000.
Takahashi, Koichi; Hayakawa, Yoshikazu; and Usui, Keizaburo, to Nissan Motor Company, Limited. Pressured fluid supply system. 4,193,264, Cl. 60-397.000.
Takahashi, Noriaki: *See—*
Kawamata, Naoyuki; Itoh, Tadahara; and Takahashi, Noriaki, 4,193,971, Cl. 423-242.000.
Takahashi, Ryo: *See—*
Kotaka, Mitsuo; Ishikawa, Hirotoshi; Muraki, Kaisuke; Takahashi, Ryo; and Matsuura, Tamizo, 4,194,118, Cl. 250-343.000.
Takahashi, Soshiro: *See—*
Shudo, Koichi; Okamoto, Toshihiko; Isogai, Yo; and Takahashi, Soshiro, 4,193,788, Cl. 71-94.000.
Takara Co., Ltd.: *See—*
Ogawa, Iwakichi, 4,193,597, Cl. 273-405.000.
Takeuchi, Shigeo, to Takeuchi Tekko Kabushiki Kaisha. Combined new oil vending and waste oil removing apparatus. 4,193,487, Cl. 194-9.00T.
Takeuchi, Shozo: *See—*
Yasumatsu, Mutsuo; Katayama, Kenji; Takeuchi, Shozo; and Saito, Yoshio, 4,194,019, Cl. 426-580.000.
Takeuchi Tekko Kabushiki Kaisha: *See—*
Takeuchi, Shigeo, 4,193,487, Cl. 194-9.00T.
Talamantes, Carlos, Jr. High speed boat hull. 4,193,369, Cl. 114-290.000.
Tam, William A.: *See—*
DeGraaf, Douglas W.; and Tam, William A., 4,193,368, Cl. 114-230.000.
Tamaki, Hiroshi: *See—*
Awane, Katunobu; Hattori, Hironori; Biwa, Tetuo; and Tamaki, Hiroshi, 4,194,214, Cl. 357-41.000.
Tamaki, Masahiko: *See—*
Miller, Dennis P.; and Tamaki, Masahiko, 4,194,068, Cl. 521-107.000.
Tamura Electric Works, Ltd.: *See—*
Tobeta, Kanji; and Otsuka, Shuji, 4,193,256, Cl. 368-74.000.
Tamura, Keiichi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Seatbelt retractor. 4,193,565, Cl. 242-107.40A.
Tanabe, Kenzo; and Kanno, Masashi, to Matsushita Electric Industrial Co., Ltd. Integrated front end circuit for VHF receiver. 4,194,158, Cl. 455-333.000.
Tanaka, Haruo: *See—*
Omura, Satoshi; Tanaka, Haruo; Awaya, Juichi; and Hata, Toju, 4,194,064, Cl. 435-125.000.
Tanaka, Hiroshi; and Tsuneda, Terukuni, to Canon Kabushiki Kaisha. Method for preventing degradation of a liquid developer for electrostatic recording. 4,194,020, Cl. 427-16.000.
Tanaka, Masahide: *See—*
Yasukuni, Mitsuo; Ogura, Toshinobu; Omaki, Takanobu; and Tanaka, Masahide, 4,193,667, Cl. 350-187.000.
Tanigawa, Koichi; and Ishihara, Takayuki, to Canon Kabushiki Kaisha. Liquid feeding device. 4,193,681, Cl. 355-3.0FU.

Tanson, Rodolphe F.: *See—*
Rinio, Johannes A.; and Tanson, Rodolphe F., 4,193,311, Cl. 74-230.500.
Tassie, Douglas P., to General Electric Company. Gun misfire control. 4,193,335, Cl. 89-7.000.
Taylor, Edward B.: *See—*
Eliot, Christopher M.; and Taylor, Edward B., 4,193,602, Cl. 273-236.000.
Taylor, Paul F. Process for Class IIIB metals ore reduction. 4,193,792, Cl. 75-84.000.
TDK Electronics Co., Ltd.: *See—*
Nakajima, Takashi; Nagano, Katsuto; and Ishikawa, Kazumi, 4,194,108, Cl. 219-216.000.
Technicon Instruments Corp.: *See—*
Keyes, Melvin H., 4,194,067, Cl. 435-190.000.
Tecnoma: *See—*
Ballu, Vincent P. M., 4,193,547, Cl. 239-156.000.
Ted Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec: *See—*
Redlich, Horst, 4,194,094, Cl. 179-100.41P.
Teitel, Sidney: *See—*
Gurien, Harvey; and Teitel, Sidney, 4,193,923, Cl. 260-315.000.
Teldix GmbH: *See—*
Rockl, Gerhard; Nieder, Gerhard; and Schulz, Hans-Holger, 4,193,646, Cl. 308-187.100.
Telefonaktiebolaget L M Ericsson: *See—*
Bjorklund, Fritz L. G.; Sandberg, Carl-Olof; Sternbeck, Olaf; and Wern, Lars A., 4,194,134, Cl. 307-255.000.
Telex Communications, Inc.: *See—*
Guess, Joe F.; and Gastmeier, William J., 4,193,647, Cl. 310-324.000.
Teng, James; Lucas, James M.; and Stubits, Marcella C., to Anheuser-Busch, Incorporated. Sunscreen gel. 4,193,989, Cl. 424-60.000.
Tenneco Chemicals, Inc.: *See—*
Sidi, Henri, 4,193,890, Cl. 252-407.000.
Stone, Herman; and Pauly, Peter D., 4,193,887, Cl. 252-91.000.
Terminal Data Corporation: *See—*
Rudy, Michael W.; Kramer, Edward J.; Bondar, Martin M.; and Whitney, Ronald L., 4,193,685, Cl. 355-41.000.
Ternynck, Therese M. F.: *See—*
Avrameas, Stratis; and Ternynck, Therese M. F., 4,193,982, Cl. 424-12.000.
Teti, Joseph A., Jr.: *See—*
Breton, Ernest J.; Wolf, Jack D.; and Worden, Dexter, 4,194,040, Cl. 428-308.000.
Teti, William C.: *See—*
Breton, Ernest J.; Wolf, Jack D.; and Worden, Dexter, 4,194,040, Cl. 428-308.000.
Texaco Development Corporation: *See—*
Gillespie, Ronald G., 4,194,163, Cl. 330-86.000.
Marquis, Edward T.; and Yeakey, Ernest L., 4,194,070, Cl. 521-163.000.
Speranza, George P.; and Zimmerman, Robert L., 4,194,069, Cl. 521-129.000.
Texaco Inc.: *See—*
Muenger, James R.; and Barber, Everett M., 4,193,259, Cl. 60-39.040.
Sustek, Alvin J., Jr.; and Scott, Thomas G., 4,193,290, Cl. 73-29.000.
Texas Instruments Incorporated: *See—*
Boulanger, Henry J.; and Rizzo, Salvatore P., 4,193,181, Cl. 29-509.000.
Theakston, Harry A.: *See—*
United States of America, National Aeronautics and Space Administration; Charles, James F.; and Theakston, Harry A., 4,193,435, Cl. 151-41.760.
Thermal Economics, Inc.: *See—*
Posner, Louis L.; and McGarry, Patrick J., 4,193,225, Cl. 49-465.000.
Thies, James F.: *See—*
Gross, Gary; and Thies, James F., 4,193,145, Cl. 4-346.000.
Thiruvengadam, Alagu P.; and Hochrein, Ambrose A., Jr. Controlled cavitation erosion process and system. 4,193,635, Cl. 299-17.000.
Thomas, Friedrich W., to Leybold-Heraeus GmbH & Co. KG. Apparatus for regulating the depth of immersion of consumable electrodes in electroslag remelting furnaces. 4,194,078, Cl. 13-9.0ES.
Thomas, Herbert: *See—*
Niemers, Ekkehard; Wollweber, Hartmund; Kolling, Heinrich; and Thomas, Herbert, 4,194,004, Cl. 424-300.000.
Thomas, Richard N.: *See—*
Shepherd, Brian; and Thomas, Richard N., 4,194,199, Cl. 340-754.000.
Thomas, Ronald, to Organisation Europeenne de Recherches Spatiales. Interconnection device for solar cells. 4,193,820, Cl. 136-89.00P.
Thomas, Theodore T., Jr.: *See—*
Landis, Delmer H., Jr.; Thomas, Theodore T., Jr.; and Haap, Charles J., 4,193,738, Cl. 415-115.000.
Thomaswick, Ronald J., to PPG Industries, Inc. Railway car loose sheet material shipping support loading arrangement. 4,193,736, Cl. 414-786.000.
Thomson-CSF: *See—*
Cojan, Yves, 4,193,666, Cl. 350-174.000.
d'Auria, Luigi; Dubos, Jacques; and Jacques, Andre, 4,193,661, Cl. 350-96.160.
Hartemann, Pierre, 4,193,473, Cl. 181-176.000.
Picquendar, Jean-Edgar, 4,194,172, Cl. 333-165.000.
Reymond, Jean-Claude; and Hidalgo, Jean-Luc, 4,193,689, Cl. 356-152.000.
Thorburn, Herbert J.; and Tracy, John A., to Alcan Research and Development Limited. Belt-cooling and guiding means for the continuous belt casting of metal strip. 4,193,440, Cl. 164-432.000.
Thrasher, Donald D. Manure collection and storage system. 4,193,873, Cl. 210-170.000.
Timmermann, Christian, to Robert Bosch GmbH. Coupling-equipped light guide. 4,193,663, Cl. 350-96.180.
Tiner, Francis L. Panel repair kit. 4,193,243, Cl. 52-514.000.
Tingler, Kenneth L.: *See—*
Sandhu, Mohammad A.; and Tingler, Kenneth L., 4,193,803, Cl. 430-627.000.
Tobeta, Kanji; and Otsuka, Shuji, to Tamura Electric Works, Ltd. Digital clocks provided with time switch mechanisms. 4,193,256, Cl. 368-74.000.
Toeniskoetter, Richard H.: *See—*
Lundberg, John A.; Schafer, Robert J.; Toeniskoetter, Richard H.; and Pelfrey, Richard L., 4,193,909, Cl. 260-42.150.
Tokoro, Takeshi. Radio communication system. 4,194,152, Cl. 455-31.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Hamano, Eizaburo; and Komatsu, Tetsuo, 4,194,140, Cl. 313-471.000.
Ohkubo, Hitoshi, 4,194,148, Cl. 324-453.000.
Uematsu, Yutaka; and Unno, Yoichi, 4,194,162, Cl. 330-4.300.
Tolles, William M.: *See—*
Levenson, Marc D.; Eesley, Gary L.; Tolles, William M.; and Song, Jin-Joo, 4,193,690, Cl. 356-301.000.
Tombrello, Thomas A.: *See—*
United States of America, National Aeronautics and Space Administration; Whitehead, A. Bruce; and Tombrello, Thomas A., 4,194,115, Cl. 250-308.000.
Tonka Corporation: *See—*
Pauly, Ronald R.; Good, Thomas W.; Hastings, John D.; and Ryan, Kevin D., 4,193,639, Cl. 301-9.0DH.
Toome, Valdemar: *See—*
Hengartner, Urs; Reymond, Gilbert; and Toome, Valdemar, 4,193,850, Cl. 204-79.000.
Toray Industries, Inc.: *See—*
Okubo, Katsuyuki; Ueda, Nobuyasu; and Ono, Tetsumi, 4,193,474, Cl. 181-287.000.
Tosco Corporation: *See—*
Leon, F. Roland, 4,193,756, Cl. 432-3.000.
Vawter, R. Glenn; and Waitman, Charles S., 4,193,760, Cl. 432-96.000.
Toshkova, Tanya G.: *See—*
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Toth, Istvan: *See—*
Szantay, Csaba; Szabo, Lajos; Toth, Istvan; Kanyo, Erzsebet; Sebestyen, Gyula; and Virag, Sandor, 4,193,998, Cl. 424-258.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Morino, Hideki; and Yasui, Yasuyoshi, 4,193,322, Cl. 74-700.000.
Tracy, John A.: *See—*
Thorburn, Herbert J.; and Tracy, John A., 4,193,440, Cl. 164-432.000.
Transportteknik Gunnar Ekstrand AB: *See—*
Ekstrand, Kjell G., 4,193,493, Cl. 198-781.000.
Travenol Laboratories, Inc.: *See—*
Robinson, Thomas P., 4,193,399, Cl. 128-214.400.
Treace, Harry T., to Richards Manufacturing Company, Inc. Knee prosthesis. 4,193,140, Cl. 3-1.911.
Treacy, Thomas P. Shoring assembly for a trench or hole. 4,193,717, Cl. 405-283.000.
Trepanier, Donald L.; and Britton, Thomas C., to Dow Chemical Company, The. Psychoactive 1,3,4-benzotriazepine-2-thiones and a method for treating central nervous system depression and anxiety. 4,194,000, Cl. 424-270.000.
Trindle, Dean D.; and Amneus, John S., to Procter & Gamble Company. Disposable infant nurser. 4,193,506, Cl. 215-11.00C.
Trio Kabushiki Kaisha: *See—*
Sakai, Kazumasa; and Watanuki, Hiroshi, 4,194,166, Cl. 330-257.000.
Sakaida, Kaku, 4,194,087, Cl. 179-1.0GD.
Trochman, John E. Collapsible and portable structure. 4,193,414, Cl. 135-4.00R.
Trofimov, Oleg F.: *See—*
Egorov, Viktor P.; Ognevsky, Viktor A.; Orlovsky, Anatoly G.; Ostrovsky, Grigory A.; Ryskind, Alexandr M.; Stepin, Anatoly L.; Trofimov, Oleg F.; and Shklyarov, Isaak N., 4,193,824, Cl. 148-12.400.
Trombley, Wayne E.; and Seger, Ronald G., to Dow Corning Corporation. Contact lens with improved interior surface. 4,193,672, Cl. 351-160.00R.
Trunley, Roy: *See—*
Hopwood, Howard R.; and Trunley, Roy, 4,193,801, Cl. 430-570.000.
TRW, Inc.: *See—*
English, William D., 4,193,261, Cl. 60-218.000.
Haller, Jacob S.; Mines, Gordon L.; and Mischnick, Meinert J., 4,193,187, Cl. 29-749.000.
Tsao, Utah; and Sy, Angel, to Lummus Company, The. Purging of inerts in chlorinated hydrocarbon production. 4,193,944, Cl. 260-659.00R.

Tsou, Joe M.: *See—*
Sharp, David W.; Clavenna, LeRoy R.; Gorbaty, Martin L.; and Tsou, Joe M., 4,193,771, Cl. 48-197.00R.
Tsuchida, Haruo: *See—*
Saito, Tadao; Nozawa, Takamitsu; Tsuchida, Haruo; Iizuka, Shigeo; and Goto, Takayuki, 4,193,551, Cl. 239-333.000.
Tsuda, Toshitaka, to Fujitsu Limited. Data processing system having portions of data addressing and instruction addressing information provided by a common source. 4,194,243, Cl. 364-200.000.
Tsuda, Yasuo: *See—*
Iwama, Hideaki; Koyama, Mikio; Tsuda, Yasuo; and Asano, Masao, 4,193,800, Cl. 430-213.000.
Tsui, James B. Y.; and Schrick, Gerd H., to United States of America, Air Force. Instantaneous frequency measurement (IFM) receiver with capability to separate cw and pulsed signals. 4,194,206, Cl. 343-18.00E.
Tsui, Kwok Wa: *See—*
D'Andrade, Bruce M.; and Tsui, Kwok Wa, 4,193,223, Cl. 46-209.000.
Tsuji, Okitsugu: *See—*
Murai, Yoshikazu; Tsuji, Okitsugu; and Sato, Atsushi, 4,193,764, Cl. 8-94.220.
Tsuneda, Terukuni: *See—*
Tanaka, Hiroshi; and Tsuneda, Terukuni, 4,194,020, Cl. 427-16.000.
Tuccio, Sam A., to Allied Chemical Corporation. Isotope separation by multiphoton dissociation of methylamine with an infrared laser. 4,193,855, Cl. 204-158.00R.
Tucker, Elton M.; and Prosl, Frank R., to Metal Bellows Corporation. Infusion apparatus and method. 4,193,397, Cl. 128-207.190.
Tuftco Corporation: *See—*
Beasley, Max M., 4,193,359, Cl. 112-79.00R.
Turner, Henry H. Stem growth control device and method. 4,193,224, Cl. 47-58.000.
Turnquist, Peter. Automatic memory trainer. 4,193,210, Cl. 35-9.00A.
Tyrer, Andrew C. R.; and Lace, David G., to R. Perry & Company Limited; and Tyrer, Andrew Charles Ratcliffe. Life jacket. 4,193,153, Cl. 9-342.000.
Tyrer, Andrew Charles Ratcliffe: *See—*
Tyrer, Andrew C. R.; and Lace, David G., 4,193,153, Cl. 9-342.000.
Uchida, Mitsuo; Oguri, Yasuo; Saito, Junji; and Kawahara, Tsukasa, to Mitsubishi Chemical Industries, Limited. Process for preparing calcium silicate shaped product. 4,193,958, Cl. 264-86.000.
Ueda, Hiroshi; Saito, Mitsuru; Nanba, Yasuhiro; and Kuramoto, Yoshio, to Minolta Camera Kabushiki Kaisha. Data photographic device for camera. 4,193,676, Cl. 354-106.000.
Ueda, Nobuyasu: *See—*
Okubo, Katsuyuki; Ueda, Nobuyasu; and Ono, Tetsumi, 4,193,474, Cl. 181-287.000.
Ueda, Takeshi. Spike assembly for sports shoes. 4,193,216, Cl. 36-67.00D.
Uematsu, Yutaka; and Unno, Yoichi, to Tokyo Shibaura Electric Co., Ltd. Semiconductor device. 4,194,162, Cl. 330-4.300.
Uhtenwoldt, Herbert R., to Cincinnati Milacron-Heald Corporation. Adaptive grinding control. 4,193,227, Cl. 51-165.770.
Ukrainsky Nauchno-Issledovatelsky Institut Tsellyulozno-Bumazhoi Promyshlennosti (UKRNIIB): *See—*
Pankratov, Vladimir I.; Konovalenko, Gennady P.; Prilipko, Ivan T.; and Gomberg, Moris L., 4,194,114, Cl. 250-308.000.
Ullman, Edwin F.; and Brinkley, John M., to Syva Company. Labeled liposome particle compositions and immunoassays therewith. 4,193,983, Cl. 424-12.000.
Ullmann, Karl H., to Harnischfeger Corporation. Hydraulic excavator machine having self-contained electrohydraulic power units. 4,193,733, Cl. 414-694.000.
Umezawa, Kazumi: *See—*
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; and Sagara, Seiji, 4,193,483, Cl. 192-26.000.
Union Carbide Corporation: *See—*
Cheung, Harry, 4,193,793, Cl. 75-235.000.
Drnevich, Raymond F.; Matsch, Ladislas C.; and Srinath, Embar G., 4,193,854, Cl. 204-149.000.
Goeke, George L.; and Karol, Frederick J., 4,193,892, Cl. 252-428.000.
Kotval, Peshotan S.; and Strock, Harold B., 4,193,974, Cl. 423-348.000.
Kotval, Peshotan S.; and Strock, Harold B., 4,193,975, Cl. 423-348.000.
Sauers, Marvin E., 4,194,071, Cl. 525-480.000.
Union Oil Company of California: *See—*
Light, Steven D.; and Ward, John W., 4,193,895, Cl. 252-441.000.
Uniroyal: *See—*
Devienne, Andre M.; Igea, Gilbert L.; and Bernard, Jean-Pierre L., 4,193,429, Cl. 141-4.000.
Uniroyal, Inc.: *See—*
Borisuck, John F.; Coviello, William L.; and Sheedy, Gary W., 4,193,155, Cl. 12-40.000.
United Foam Corporation: *See—*
Goodale, Clark W.; Morgan, Charles W.; Rhoton, Albert L.; and McNeil, David F., 4,194,026, Cl. 427-244.000.
United Merchants and Manufacturers, Inc.: *See—*
Namboodri, Chettoor G., 4,193,762, Cl. 8-14.000.
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Agriculture: *See—*
Harper, Robert J., Jr.; Calamari, Timothy A., Jr.; and Schreiber, Sidney P., 4,194,032, Cl. 427-341.000.
Weaver, Merle L.; and Ng, Keng C., 4,194,016, Cl. 426-419.000.
Air Force: *See—*
Coulbourn, Charles B., Jr., 4,194,209, Cl. 343-753.000.
Goldie, Harry, 4,194,200, Cl. 343-5.0SM.
Morrison, Steven; and Lisle, Thomas K., Jr., 4,194,186, Cl. 340-347.0AD.
Tsui, James B. Y.; and Schrick, Gerd H., 4,194,206, Cl. 343-18.00E.
Willmore, Robert R.; and McCartney, William B., 4,194,205, Cl. 343-17.700.
America: *See—*
Davis, Thomas J., 4,194,240, Cl. 363-126.000.
Army: *See—*
Garcia, Moises R., 4,193,286, Cl. 72-462.000.
Glendinning, William B., 4,194,187, Cl. 340-347.0AD.
Jezek, Bruce W.; and McClung, Glen L., 4,193,328, Cl. 81-72.000.
Energy: *See—*
Childs, Everett L.; and Long, Jack L., 4,193,853, Cl. 204-129.950.
Folser, George R., 4,193,860, Cl. 204-284.000.
Kurnit, Norman A., 4,194,170, Cl. 331-94.50N.
Rider, Robert L., 4,193,422, Cl. 137-625.490.
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Charles, James F.; and Theakston, Harry A. Floating nut retention system. 4,193,435, Cl. 151-41.760.
Schindler, Rudolf A. Velocity servo for continuous scan Fourier interference spectrometer. 4,193,693, Cl. 356-346.000.
Whitehead, A. Bruce; and Tombrello, Thomas A. Method and means for helium/hydrogen ratio measurement by alpha scattering. 4,194,115, Cl. 250-308.000.
Yang, Lien C. Portable heatable container. 4,193,388, Cl. 126-263.000.
National Aeronautics and Space Administration: *See—*
Hoffman, Henry C.; and Donohue, James H., 4,193,570, Cl. 244-165.000.
Kourtides, Demetrius A.; and Parker, John A., 4,193,829, Cl. 156-276.000.
Woollam, John A., 4,193,827, Cl. 149-1.000.
Navy: *See—*
Adicoff, Arnold; Finnegan, William G.; McBride, William R.; and Ayres, William M., 4,193,952, Cl. 264-3.00B.
Alpers, Frederick C., 4,194,204, Cl. 343-7.400.
Anderson, Alton D.; and Estes, Nelson N., 4,193,346, Cl. 102-18.00R.
Crist, Ralph P., 4,194,246, Cl. 367-1.000.
Dick, Charles B.; Knutson, Curtis L.; Jones, Frederick W.; and Ireland, Richard D., 4,193,529, Cl. 228-107.000.
Dowgul, Ronald W., 4,193,966, Cl. 422-122.000.
Doyle, William E., 4,194,202, Cl. 343-7.0PF.
Gerard, William A., 4,194,142, Cl. 315-39.770.
Jelks, Edward C., 4,194,171, Cl. 333-149.000.
Kuck, John H., 4,194,203, Cl. 343-7.0PF.
Lewis, Bernard L., 4,194,244, Cl. 364-428.000.
Messick, Louis J., 4,194,021, Cl. 427-95.000.
Obenschain, Arthur W., 4,194,150, Cl. 324-245.000.
Papineau, Milton D., 4,194,167, Cl. 331-38.000.
Pasour, John A.; Kapetanakos, Christos A.; Mahaffey, Redge A.; and Golden, Jeffry, 4,194,139, Cl. 313-153.000.
Plotkin, Gerald N., 4,193,297, Cl. 73-167.000.
Redfern, John T., 4,194,194, Cl. 340-566.000.
U.S. Philips Corporation: *See—*
Shannon, John M., 4,194,133, Cl. 307-221.00D.
United Technologies Corporation: *See—*
Benincasa, John J.; and Hage, Marvin L., 4,193,367, Cl. 114-68.000.
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Levenson, Marc D.; Eesley, Gary L.; Tolles, William M.; and Song, Jin-Joo, 4,193,690, Cl. 356-301.000.
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Langer, Teresa; Krukowska-Fulde, Barbara; and Langer, Jerzy, 4,194,141, Cl. 313-503.000.
Unno, Yoichi: *See—*
Uematsu, Yutaka; and Unno, Yoichi, 4,194,162, Cl. 330-4.300.
Uno, Takeshi, to Sony Corporation. Portable radio receiver with detachable speaker unit. 4,194,157, Cl. 455-348.000.
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Vallee, Louis L. Sheet metal roofing system. 4,193,242, Cl. 52-469.000.

Vance, Bess L.: *See*—
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van Dalen, Dirk J.: *See*—
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van den Berg, Pieter: *See*—
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van den Bosch, Francois J. G. Method and apparatus for in-vivo spectroscopic analysis. 4,194,217, Cl. 358-93.000.

VandenHoek, Harold L.; and Breiner, Frank S., to Steelcase Inc. Adjustable panel stabilizer. 4,193,233, Cl. 52-122.000.

Vandermark, Harold F., to Nu-Concept Computer Systems, Inc. Solder evacuation unit. 4,193,160, Cl. 15-341.000.

Van Dyck, Kenneth: *See*—
Miller, Scott; Bushman, Thomas; Kruger, Kurt; and Van Dyck, Kenneth, 4,193,704, Cl. 402-19.000.

van Eijk, Louwrens J.: *See*—
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Van Heel, Henry: *See*—
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Van Horn, Robert H., to Bell Telephone Laboratories, Incorporated. Solderless electrical connector construction. 4,193,201, Cl. 339-98.000.

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Van Scott, Eugene J.; and Yu, Ruey J. α-Hydroxyretinoic acid, α-ketoretinoic acid and mixtures and their use in treating skin conditions. 4,194,007, Cl. 424-318.000.

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Vass, George S., to Eastern Company, The. Mine roof support method and apparatus. 4,193,715, Cl. 405-261.000.

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King, Alan M., 4,193,321, Cl. 74-567.000.

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Vering, Antonius: *See*—
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Vetter, Klaus; and Baudendistel, Hermann, deceased (by Baudendistel, Rosemarie, heir), to Stierlen-Maquet Aktiengesellschaft. Loading and unloading station for conveyors with suspended trolley driving systems. 4,193,732, Cl. 414-609.000.

Vian, David R. Dual bimetal relief valve. 4,193,442, Cl. 165-35.000.

Victor Company of Japan, Limited: *See*—
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Viesturs, Eric A.; and Viesturs, Gundar E. Solar heating system. 4,193,543, Cl. 126-430.000.

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Viglietti, John E.: *See*—
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Vincent, Peter I.: *See*—
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Vineberg, Arthur. Elevated mattress. 4,193,150, Cl. 5-431.000.

Vineyard, Billy D.: *See*—
Bachman, Gerald L.; and Vineyard, Billy D., 4,194,051, Cl. 560-60.000.

Vinokurov, Alexandr A.; Gorbunov, Gennady S.; Popov, Jury S.; Skachkov, Jury V.; Filippov, Iosif F.; and Khutoretsky, Gary M., to Spetsialnoe Konstruktorskoe Bjuro "Energokhimmash"; and Leningradskoe Proizvodstvennoe Elektromashinostroitelnoe Obiedinenie "Elektrosila". Device for delivering cryogen to rotary superconducting winding of cryogen-cooled electrical machine. 4,194,137, Cl. 310-52.000.

Virag, Sandor: *See*—
Szantay, Csaba; Szabo, Lajos; Toth, Istvan; Kanyo, Erzsebet; Sebestyen, Gyula; and Virag, Sandor, 4,193,998, Cl. 424-258.000.

Vitale, Carmen. Apparatus for carrying and dispensing cable. 4,193,563, Cl. 242-85.000.

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Matsushita, Yoshiaki, 4,193,783, Cl. 65-31.000.

Vogel, Kenneth E.; and Powlas, Jerome D., to McQuay-Perfex Inc. Head pressure control for heat reclaim refrigeration systems. 4,193,781, Cl. 62-81.000.

Vollmer, Udo: *See*—
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Vollmer Werke, Maschinenfabrik GmbH: *See*—
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Vondracek, James. Snow scoop. 4,193,626, Cl. 294-54.000.

W. H. Brady Co.: *See*—
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W. L. Gore & Associates, Inc.: *See*—
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WABCO Westinghouse GmbH: *See*—
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Wagner, David P., to Illinois Tool Works Inc. Preassembled fastener unit for clamping plastic workpieces. 4,193,434, Cl. 151-38.000.

Wagner, Remy: *See*—
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Wahle, Gunter; Heitmann, Uwe; Oesterling, Erwin; and Dahlgrun, Rolf, to Hauni-Werke Korber & Co. Kg. Method and apparatus for regulating the permeability of wrapping material for rod-shaped smokers' products. 4,193,409, Cl. 131-23.00R.

Wahrendorf, York A.; Frenzel, Herbert K.; Ambrosch, Adolf K.; Rasmussen, Knud A.; Seibert, Horst; and Dieckmann, Horst J., to SF-Vollverbundstein-Kooperation GmbH. Earth retaining wall of vertically stacked chevron shaped concrete blocks. 4,193,718, Cl. 405-286.000.

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Wallac Oy: *See*—
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Wang, Chia-Gee. Methods and apparatus for separating gases with ventilated blades. 4,193,775, Cl. 55-17.000.

Wang, Chin-Yuan. Changeable sandal. 4,193,214, Cl. 36-11.500.

Ward, John A., to AMP Incorporated. Extraction device for extracting a DIP from a DIP header. 4,193,656, Cl. 339-45.00M.

Ward, John W.: *See*—
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Wardlow, Eddie, Jr.: *See*—
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Wasala, Tadeusz; Dmoch, Marek; and Jozwiak, Henryk, to Instytut Nawozow Sztucznych. Method for the purification of the process condensate from synthesis gases and hydrogen plant. 4,193,776, Cl. 55-49.000.

Wasson, Burton K.; and Weinstock, Leonard M., to Merck Sharp & Dohme (I.A.) Corp. 2-(3-Substituted amino-2-hydroxypropoxy)-3-substituted pyrazine compounds and compositions. 4,193,995, Cl. 424-250.000.

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Watkins, Paul F. Programmable metronome. 4,193,257, Cl. 84-484.000.

Watkins, Robert A., to Raytheon Company. Optical scanning system. 4,193,688, Cl. 356-152.000.

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Watson, Hugh R.; Rowsell, David G.; and Spring, David J., to Wilkinson Sword Limited. N-substituted paramenthane carboxamides. 4,193,936, Cl. 260-557.00R.

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Welch, Robert J. D. Beds and mattresses. 4,193,149, Cl. 5-447.000.
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Weston, David, to Reynolds Metals Company. Concentration of hydrated aluminum oxide minerals by flotation. 4,193,791, Cl. 75-2.000.
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White, Harold R.; and Doncer, Alexander J., Jr., to Alar Engineering Corporation. Clarifier. 4,193,871, Cl. 210-142.000.
White, Jack E., to J & D Enterprises. Self-flushing ball seal disconnect. 4,193,576, Cl. 251-149.600.
White, Preston S., to PPG Industries, Inc. Extraction of phenylenediamine from aqueous alkaline solution. 4,193,938, Cl. 260-582.000.
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Williams, Derrick G., to Massey-Ferguson Services N.V. Boom for backhoe with internally disposed hydraulic feed lines. 4,193,734, Cl. 414-694.000.
Williams, Robert E.; and Marritt, Clifford R., to Molins, Limited. Apparatus for making ventilated cigarettes. 4,193,410, Cl. 131-170.00R.
Willmore, Robert R.; and McCartney, William B., to United States of America, Air Force. R.F. Power and video modulation monitoring circuit for countermeasures system. 4,194,205, Cl. 343-17.700.
Wilson, Alexander I., to Hill Engineering Company Limited. Rolling machine. 4,193,282, Cl. 72-194.000.
Wilson, Bradford W. Arm and wrist exerciser. 4,193,593, Cl. 272-137.000.
Wilson, Clive W.: *See*—
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Winfield, Robert J. Roller attachment for a vehicle. 4,193,729, Cl. 414-532.000.
Wingler, Frank; Eicher, Theobald; Muller, Friedemann; Fischer, Winfried; and Prinz, Richard, to Bayer Aktiengesellschaft. Contact lenses formed of mixtures of cellulose esters and ethylene/vinyl acetate copolymers. 4,193,897, Cl. 260-17.00R.
Wirz, Walter, to Fahrni, Peter. Continuous-flow mixer for the gluing of loose chips of wood, fibers, or other particles. 4,193,700, Cl. 366-156.000.
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Woods, Maurice G. Solid waste disposal system. 4,193,354, Cl. 110-212.000.
Woollam, John A., to United States of America, National Aeronautics and Space Administration. Atomic hydrogen storage. 4,193,827, Cl. 149-1.000.
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Wurr, Jurgen; Vering, Antonius; and Ermer, Bodo, to Polysius AG. Rotary kiln with a plurality of planetary cooling tubes. 4,193,759, Cl. 432-78.000.
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Yabe, Hideo; and Sato, Shohei, to Nippon Electric Co., Ltd. Decentralized-control type electronic switching system. 4,194,090, Cl. 179-18.0ES.
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Yamamoto, Yoshinori; Imai, Hideo; and Ishimatsu, Yoshikazu, to Sony Corporation. Mode selecting assembly for recording and/or reproducing apparatus. 4,194,229, Cl. 360-137.000.
Yamazaki, Shuichi; and Ban, Keisuki, to Honda Giken Kogyo Kabushiki Kaisha. Screw blower. 4,193,749, Cl. 418-201.000.
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United States of America, National Aeronautics and Space Administration; and Yang, Lien C., 4,193,388, Cl. 126-263.000.
Yasuda, Yasumichi: *See*—
Mochizuki, Yasuhiro; Hachino, Hiroaki; Yasuda, Yasumichi; Misawa, Yutaka; and Ogawa, Takuzo, 4,193,826, Cl. 148-189.000.
Yasui, Yasuyoshi: *See*—
Morino, Hideki; and Yasui, Yasuyoshi, 4,193,322, Cl. 74-700.000.
Yasukuni, Mitsuo; Ogura, Toshinobu; Omaki, Takanobu; and Tanaka, Masahide, to Minolta Camera Kabushiki Kaisha. Zoom lens system capable of constant magnification photography. 4,193,667, Cl. 350-187.000.
Yasumatsu, Mutsuo; Katayama, Kenji; Takeuchi, Shozo; and Saito, Yoshio, to Calpis Shokuhin Kogyo Kabushiki Kaisha. Preparation of an acidified milk beverage. 4,194,019, Cl. 426-580.000.
Yeakey, Ernest L.: *See*—
Marquis, Edward T.; and Yeakey, Ernest L., 4,194,070, Cl. 521-163.000.
Yeates, Richard P.: *See*—
Niggemeier, Joseph F.; and Yeates, Richard P., 4,193,350, Cl. 410-64.000.
Yokogawa Electric Works, Ltd.: *See*—
Kotaka, Mitsuo; Ishikawa, Hirotoshi; Muraki, Kaisuke; Takahashi, Ryo; and Matsuura, Tamizo, 4,194,118, Cl. 250-343.000.
Yokota, Sekiji: *See*—
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Yoshida Kogyo K.K.: *See*—
Kanzaka, Yoshihiro, 4,193,172, Cl. 24-205.15H.
Yoshikawa, Akira; and Aota, Kouichi, to Rank Xerox Limited. Transfer sheet drying device for electrophotographic copying machine. 4,193,680, Cl. 355-3.00R.
Yoshino Kogyosho Co., Ltd.: *See*—
Saito, Tadao; Nozawa, Takamitsu; Tsuchida, Haruo; Iizuka, Shigeo; and Goto, Takayuki, 4,193,551, Cl. 239-333.000.
Yoshioka, Sunao. Apparatus for automatically producing flower-shaped decorations. 4,193,753, Cl. 425-311.000.
Yotsutani, Akio: *See*—
Masaki, Masaru; and Yotsutani, Akio, 4,194,153, Cl. 455-31.000.
Youmans, Albert P.; Allison, David F.; and Maxwell, David A., to Signetics Corporation. Method for making semiconductor structure. 4,193,836, Cl. 156-657.000.
Young, Jack H.; Karle, David A.; and Halleck, Frank E., to American Sterilizer Company. Combined ultrasonic cleaning and biocidal treatment in a single pressure vessel. 4,193,818, Cl. 134-1.000.
Young, John L., to Ex-Cell-O Corporation. Ultrasonic packaging machine. 4,193,833, Cl. 156-358.000.
Yu, Ruey J.: *See*—
Van Scott, Eugene J.; and Yu, Ruey J., 4,194,007, Cl. 424-318.000.
Zally, William J.: *See*—
Field, George F.; and Zally, William J., 4,194,049, Cl. 548-336.000.
Zauscher, Hermann, to C. Plath GmbH Nautisch Elektronische Technik. Radiolocation system for determining the direction of incident electromagnetic waves. 4,194,207, Cl. 343-120.000.
Zeiss-Stiftung, Carl: *See*—
Egle, Wilhelm, 4,194,116, Cl. 250-311.000.
Zenda, Richard J.: *See*—
Malacheski, Joseph J.; and Zenda, Richard J., 4,193,165, Cl. 16-191.000.
Zero-Max Industries, Inc.: *See*—
Gray, James A.; and Lindfors, Randall V., 4,193,650, Cl. 312-205.000.
Zikolova, Svetlana S.: *See*—
Konstantinova, Rumyana G.; Zikolova, Svetlana S.; Apostolova, Velichka I.; and Toshkova, Tanya G., 4,193,920, Cl. 260-239.30P.
Zimmer, Erich: *See*—
Langen, Hans; Ringel, Helmut; and Zimmer, Erich, 4,193,953, Cl. 264-0.500.
Zimmerman, Robert L.: *See*—
Speranza, George P.; and Zimmerman, Robert L., 4,194,069, Cl. 521-129.000.
Zirconal Processes Limited: *See*—
Davis, Richard P. B.; Emblem, Harold G.; Shaw, Richard D.; and Shelley, Stanley J., 4,194,036, Cl. 428-74.000.
Zitz, Alfred: *See*—
Strahsner, Emanuel; and Zitz, Alfred, 4,193,778, Cl. 55-238.000.
Zotos International, Inc.: *See*—
Memmott, Sharon S., 4,193,615, Cl. 283-1.00A.
Zrenner, Bernhard: *See*—
Muller, Jurgen; Pfeifer, Josef; Rheude, Alfred; Erckel, Rolf; Farber, Heinrich; and Zrenner, Bernhard, 4,193,682, Cl. 355-10.000.
Zumsteg, Horst, to Alcan Research and Development Limited. Method of deep-drawing of a container or the like from an aluminium material. 4,193,285, Cl. 72-348.000.

LIST OF REISSUE PATENTEES

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PATENTS WERE ISSUED ON THE 18TH DAY OF MARCH, 1980

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Brinadd Company: *See*—
Jackson, Junius M., deceased; and Jackson, Betty A., executrix, Re. 30,230, Cl. 175-66.000.

Bunker, Anthony J.: *See*—
Sampson, Keith G.; Jenkins, Victor F.; and Bunker, Anthony J., Re. 30,234, Cl. 525-162.000.

Eastman Kodak Company: *See*—
Wright, Hal E., Re. 30,235, Cl. 542-447.000.

Ikeda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Lens selection device. Re. 30,231, Cl. 350-183.000.

Jackson, Betty A., executrix: *See*—
Jackson, Junius M., deceased; and Jackson, Betty A., executrix, Re. 30,230, Cl. 175-66.000.

Jackson, Junius M., deceased; and by Jackson, Betty A., executrix, to Brinadd Company. Closed circuit method of circulating a substantially solid free drilling fluid. Re. 30,230, Cl. 175-66.000.

Jenkins, Victor F.: *See*—
Sampson, Keith G.; Jenkins, Victor F.; and Bunker, Anthony J., Re. 30,234, Cl. 525-162.000.

Lane, William C.; and Moffatt, Donald E., to Mead Corporation, The. Multiple layer decorated paper, laminate prepared therefrom and process. Re. 30,233, Cl. 428-207.000.

Laporte Industries, Limited: *See*—
Sampson, Keith G.; Jenkins, Victor F.; and Bunker, Anthony J., Re. 30,234, Cl. 525-162.000.

Mead Corporation, The: *See*—
Lane, William C.; and Moffatt, Donald E., Re. 30,233, Cl. 428-207.000.

Minolta Camera Kabushiki Kaisha: *See*—
Ikeda, Hiroshi, Re. 30,231, Cl. 350-183.000.

Moffatt, Donald E.: *See*—
Lane, William C.; and Moffatt, Donald E., Re. 30,233, Cl. 428-207.000.

Polaroid Corporation: *See*—
Wright, Joseph H., Re. 30,232, Cl. 352-78.00R.

Sampson, Keith G.; Jenkins, Victor F.; and Bunker, Anthony J., to Laporte Industries, Limited. Polymeric compositions. Re. 30,234, Cl. 525-162.000.

Wright, Hal E., to Eastman Kodak Company. Photosensitive colorant materials. Re. 30,235, Cl. 542-447.000.

Wright, Joseph H., to Polaroid Corporation. Large capacity film cassette. Re. 30,232, Cl. 352-78.00R.

LIST OF PLANT PATENTEES

Avron, Mordhay; and Ben-Amotz, Ami, to Yeda Research & Development Co. Ltd. Alga strain. 4,511, 3-18-80, Cl. 89.000.

Ben-Amotz, Ami: *See*—
Avron, Mordhay; and Ben-Amotz, Ami, 4,511, Cl. 89.000.

Moore, Ralph S. Miniature rose plant. 4,512, 3-18-80, Cl. 10.000.

Yeda Research & Development Co. Ltd.: *See*—
Avron, Mordhay; and Ben-Amotz, Ami, 4,511, Cl. 89.000.

LIST OF DESIGN PATENTEES

Aktiebolaget Svenska Flaktfabriken: *See*—
Holmberg, Roy, 254,506, Cl. D23-146.000.

American Home Products Corp.: *See*—
Mack, Frank J., 254,477, Cl. D9-10.000.

Amerock Corporation: *See*—
Tegner, Raymond U. H., 254,460, Cl. D6-99.000.
Tegner, Raymond U. H., 254,461, Cl. D6-99.000.

Anchor Hocking Corporation: *See*—
Thrush, James L., 254,467, Cl. D7-56.000.

Atkinson, William G., Jr.: *See*—
Parsons, Frederick L.; and Atkinson, William G., Jr., 254,505, Cl. D23-44.000.

Badge-A-Minit Ltd.: *See*—
Roebuck, Malcolm J., 254,495, Cl. D15-122.000.

Barn and Silo Stores Inc.: *See*—
Cooper, Howard, 254,508, Cl. D25-14.000.

Behlert, Austin F. Gun sight. 254,502, 3-18-80, Cl. D22-8.000.

Belasquez, Lupe S. Floating fish holder. 254,503, 3-18-80, Cl. D22-18.000.

Bell, Charles J. Pouring attachment for paint cans. 254,482, 3-18-80, Cl. D9-290.000.

Biller, Bruce A.; and Scherer, Henry W., to S & C Electric Company. High voltage fuse end fitting. 254,487, 3-18-80, Cl. D13-35.000.

Burlington Industries, Inc.: *See*—
Carroll, Barry G., 254,478, Cl. D9-193.000.

Carroll, Barry G., to Burlington Industries, Inc. Pantyhose package. 254,478, 3-18-80, Cl. D9-193.000.

Carson, Louis A. Tea bag squeezer. 254,466, 3-18-80, Cl. D7-47.000.

Cathey, Wayne C., to Xerox Corporation. Dual magnetic disc-console unit for an electronic typing system. 254,492, 3-18-80, Cl. D14-46.000.

Chich, Robert H. Rocking horse. 254,498, 3-18-80, Cl. D21-70.000.

Collins, John J.: *See*—
Nicholl, Thomas H.; Rohrs, Donald L.; and Collins, John J., 254,514, Cl. D26-26.000.

Concept, Inc.: *See*—
Guth, John F., 254,515, Cl. D26-49.000.

Cooper, Howard, to Barn and Silo Stores Inc. Building. 254,508, 3-18-80, Cl. D25-14.000.

Cox, Averil B. Patio bar and bar-b-que unit. 254,468, 3-18-80, Cl. D7-108.000.

Culbertson, Richard, to General Electric Company. Cassette tape recorder and player or similar article. 254,489, 3-18-80, Cl. D14-6.000.

Dart, Larry K., to International Telephone and Telegraph Corporation. Hand held spotlight. 254,513, 3-18-80, Cl. D26-50.000.

Dickey, Avis M., to Dickey, Inc. Font of illustration figures for children's stories and cards. 254,497, 3-18-80, Cl. D18-33.000.

Dickey, Inc.: *See*—
Dickey, Avis M., 254,497, Cl. D18-33.000.

Eastman, Jerome. Chair. 254,459, 3-18-80, Cl. D6-70.000.

Eddins, Fred D., to Hasbro Industries, Inc. Toy scanner pack. 254,500, 3-18-80, Cl. D21-109.000.

Eilertson, Arthur L., to Textron, Inc. Packaging container or similar article. 254,479, 3-18-80, Cl. D9-224.000.

Elie, David K.: *See*—
Young, Dale E., II; Elie, David K.; and Schoening, Peter K., 254,511, Cl. D30-6.000.

Finn, Norman H., to United States Shoe Corporation, The. Wedgie. 254,456, 3-18-80, Cl. D2-286.000.

Finn, Norman H., to United States Shoe Corporation, The. Open toe wedgie sneaker with toe and heal guards. 254,457, 3-18-80, Cl. D2-296.000.

Finucane, Patrick W.; and Malvasio, William A. Carpet installing tool. 254,472, 3-18-80, Cl. D8-15.000.

Finucane, Patrick W.; and Malvasio, William A. Carpet installing tool. 254,473, 3-18-80, Cl. D8-15.000.

Finucane, Patrick W.; and Malvasio, William A. Carpet installing tool. 254,474, 3-18-80, Cl. D8-15.000.

General Electric Company: *See—*
Culbertson, Richard, 254,489, Cl. D14-6.000.

Giannotti, Vincent, Jr.; and Leach, Charles R., to International Business Machines Corporation. Machine control foot pedal or the like. 254,488, 3-18-80, Cl. D13-36.000.

Gilb, Tyrell T., to Simpson Manufacturing Co., Inc. Architectural post base. 254,476, 3-18-80, Cl. D8-354.000.

Gillum, Gary C., to Klipsch and Associates, Inc. High frequency loudspeaker. 254,491, 3-18-80, Cl. D14-35.000.

Grosso, Raymond A.; and Prizlow, Alfred J., to Microelectronic Communications Corp. Stored number telephone dialing unit. 254,493, 3-18-80, Cl. D14-66.000.

Guth, John F., to Concept, Inc. Hand held examination lamp with disposable tip. 254,515, 3-18-80, Cl. D26-49.000.

Hasbro Industries, Inc.: *See—*
Eddins, Fred D., 254,500, Cl. D21-109.000.

Heckathorn, Donald W. Combined hair dryer and curling iron caddy. 254,462, 3-18-80, Cl. D6-114.000.

Hill, Jeremy R. Keyboard instrument for use with a remote synthesizer or the like. 254,496, 3-18-80, Cl. D17-1.000.

Hills Industries Limited: *See—*
Seabrook, Terence D., 254,471, Cl. D7-196.000.

Holmberg, Roy, to Aktiebolaget Svenska Flaktfabriken. Corrugated metal sheet contact body for humidifiers. 254,506, 3-18-80, Cl. D23-146.000.

Hosek, Robert. Figurine. 254,501, 3-18-80, Cl. D21-185.000.

Howw Manufacturing Company: *See—*
Wilson, Michael C., 254,463, Cl. D7-9.000.

Hull, Bette J. Dispensing indicator for a container. 254,481, 3-18-80, Cl. D9-260.000.

International Business Machines Corporation: *See—*
Giannotti, Vincent, Jr.; and Leach, Charles R., 254,488, Cl. D13-36.000.

International Harvester Company: *See—*
Montgomery, Gregg C.; and Skyer, Robert A., 254,486, Cl. D12-176.000.

International Silver Company: *See—*
Young, Stuart A., 254,464, Cl. D7-20.000.

International Telephone and Telegraph Corporation: *See—*
Dart, Larry K., 254,513, Cl. D26-50.000.

Klipsch and Associates, Inc.: *See—*
Gillum, Gary C., 254,491, Cl. D14-35.000.

Knope, William J. Article of flatware. 254,470, 3-18-80, Cl. D7-137.000.

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Perjo, Pekka, 254,484, Cl. D10-108.000.

Leach, Charles R.: *See—*
Giannotti, Vincent, Jr.; and Leach, Charles R., 254,488, Cl. D13-36.000.

Leathers, Milton. Lamp. 254,512, 3-18-80, Cl. D26-51.000.

Lindsay Excavating & Concrete Products Company: *See—*
Migchelbrink, Richard J., Jr., 254,509, Cl. D25-36.000.

Mack, Frank J., to American Home Products Corp. Combined bottle and squeegee. 254,477, 3-18-80, Cl. D9-10.000.

Malvasio, William A.: *See—*
Finucane, Patrick W.; and Malvasio, William A., 254,472, Cl. D8-15.000.
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Finucane, Patrick W.; and Malvasio, William A., 254,474, Cl. D8-15.000.

Manderfield, Ellen B., to Oneida Ltd. Spoon or similar article. 254,469, 3-18-80, Cl. D7-137.000.

Matsubara, Hideyuki, to Pioneer Kabushiki Kaisha. Loudspeaker with grille. 254,490, 3-18-80, Cl. D14-30.000.

Microelectronic Communications Corp.: *See—*
Grosso, Raymond A.; and Prizlow, Alfred J., 254,493, Cl. D14-66.000.

Migchelbrink, Richard J., Jr., to Lindsay Excavating & Concrete Products Company. Housing for a pump lift station. 254,509, 3-18-80, Cl. D25-36.000.

Montgomery, Gregg C.; and Skyer, Robert A., to International Harvester Company. Steering wheel. 254,486, 3-18-80, Cl. D12-176.000.

Myers, Harold K. Galvanic skin resistance/temperature biofeedback device. 254,504, 3-18-80, Cl. D24-17.000.

Nicholl, Thomas H.; Rohrs, Donald L.; and Collins, John J., to Nicholl, Thomas H. Combined power failure light and flash light. 254,514, 3-18-80, Cl. D26-26.000.

Oneida Ltd.: *See—*
Manderfield, Ellen B., 254,469, Cl. D7-137.000.

Owens-Illinois, Inc.: *See—*
Smalley, Ned J., 254,480, Cl. D9-254.000.

Parsons, Frederick L.; and Atkinson, William G., Jr., to Parsons, Frederick L. Hose coupling. 254,505, 3-18-80, Cl. D23-44.000.

Pauty, Bernard, to SEB. Combined salad dryer and tosser. 254,465, 3-18-80, Cl. D7-47.000.

Perjo, Pekka, to Kone Osakeyhtio. Up and down directional signal for an elevator. 254,484, 3-18-80, Cl. D10-108.000.

Pioneer Kabushiki Kaisha: *See—*
Matsubara, Hideyuki, 254,490, Cl. D14-30.000.

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Quickdraw Accessories, Inc.: *See—*
Shaak, Luther L., 254,510, Cl. D27-03.000.

Redding, James. Foot massager. 254,507, 3-18-80, Cl. D24-36.000.

Roebuck, Malcolm J., to Badge-A-Minit Ltd. Machine for assembling buttons. 254,495, 3-18-80, Cl. D15-122.000.

Rohrs, Donald L.: *See—*
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S & C Electric Company: *See—*
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Biller, Bruce A.; and Scherer, Henry W., 254,487, Cl. D13-35.000.

Schoening, Peter K.: *See—*
Young, Dale E., II; Elie, David K.; and Schoening, Peter K., 254,511, Cl. D30-6.000.

Seabrook, Terence D., to Hills Industries Limited. Rotary clothes hoist. 254,471, 3-18-80, Cl. D7-196.000.

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Pauty, Bernard, 254,465, Cl. D7-47.000.

Shaak, Luther L., to Quickdraw Accessories, Inc. Pipe. 254,510, 3-18-80, Cl. D27-03.000.

Simpson Manufacturing Co., Inc.: *See—*
Gilb, Tyrell T., 254,476, Cl. D8-354.000.

Skyer, Robert A.: *See—*
Montgomery, Gregg C.; and Skyer, Robert A., 254,486, Cl. D12-176.000.

Smalley, Ned J., to Owens-Illinois, Inc. Closure. 254,480, 3-18-80, Cl. D9-254.000.

Stainless Steel Fabricating, Inc.: *See—*
Worden, Donald G., 254,494, Cl. D15-102.000.

Steed, Ernest C. Toy distiller. 254,499, 3-18-80, Cl. D21-109.000.

Stevens, Roger C. Paddle wheel apparatus. 254,485, 3-18-80, Cl. D12-70.000.

Stover, George F. Can opener. 254,475, 3-18-80, Cl. D8-18.000.

Sunbeam Corporation: *See—*
Thomas, Richard K., 254,483, Cl. D10-1.000.

Tegner, Raymond U. H., to Amerock Corporation. Towel ring. 254,460, 3-18-80, Cl. D6-99.000.

Tegner, Raymond U. H., to Amerock Corporation. Towel bar. 254,461, 3-18-80, Cl. D6-99.000.

Textron, Inc.: *See—*
Eilertson, Arthur L., 254,479, Cl. D9-224.000.

Thomas, Richard K., to Sunbeam Corporation. Clock. 254,483, 3-18-80, Cl. D10-1.000.

Thrush, James L., to Anchor Hocking Corporation. Condiment shaker or similar article. 254,467, 3-18-80, Cl. D7-56.000.

United States Shoe Corporation, The: *See—*
Finn, Norman H., 254,456, Cl. D2-286.000.
Finn, Norman H., 254,457, Cl. D2-296.000.

Wakefield, Anne E. Hammock-type hanging chair. 254,458, 3-18-80, Cl. D6-53.000.

Wilson, Michael C., to Howw Manufacturing Company. Beverage container. 254,463, 3-18-80, Cl. D7-9.000.

Worden, Donald G., to Stainless Steel Fabricating, Inc. Cheese vat. 254,494, 3-18-80, Cl. D15-102.000.

Xerox Corporation: *See—*
Cathey, Wayne C., 254,492, Cl. D14-46.000.

Young, Dale E., II; Elie, David K.; and Schoening, Peter K. Rearing tank. 254,511, 3-18-80, Cl. D30-6.000.

Young, Stuart A., to International Silver Company. Gallery tray. 254,464, 3-18-80, Cl. D7-20.000.

CLASSIFICATION OF PATENTS

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88 4,193,787
94 4,193,788
103 4,193,789
116 4,193,790

CLASS 72

44 4,193,279
59 4,193,280
130 4,193,281
194 4,193,282
204 4,193,283
325 4,193,284
348 4,193,285
462 4,193,286

CLASS 73

1 R 4,193,288
27 R 4,193,289
29 4,193,290
32 A 4,193,291
38 4,193,292
64.1 4,193,293
141 A 4,193,294
146.8 4,193,295
167 4,193,297
194 EM 4,193,298
194 F 4,193,296
199 4,193,299
204 4,193,300
207 4,193,301
351 4,193,302
438 4,193,303
462 4,193,304
4,193,305
629 4,193,306
701 4,193,307

CLASS 74

5.22 4,193,308
217 B 4,193,309
230.3 4,193,310
230.5 4,193,311
231 C 4,193,312
231 P 4,193,313
242.11 R 4,193,315
242.5 4,193,314
477 4,193,316
479 4,193,317
489 4,193,318
501 R 4,193,319
535 4,193,320
567 4,193,321
700 4,193,322
733 4,193,323
750 B 4,193,324
801 4,193,325

CLASS 75

2 4,193,791
84 4,193,792
235 4,193,793

CLASS 76

74 4,193,326

CLASS 81

55 4,193,327
72 4,193,328

CLASS 83

250 4,193,329
364 4,193,330
468 4,193,331

CLASS 84

1.01 4,193,332
484 4,193,257

CLASS 85

31 4,193,333

CLASS 89

7 4,193,335
41 E 4,193,334

CLASS 91

488 4,193,336

CLASS 92

31 4,193,337

CLASS 98

1 4,193,338
2.14 4,193,339

CLASS 100

34 4,193,340
93 P 4,193,341
154 4,193,342

CLASS 101

35 4,193,343
126 4,193,344
365 4,193,345

CLASS 102

18 R 4,193,346
38 CC 4,193,347
91 4,193,348

CLASS 106

18.15 4,193,805
20 4,193,806
47 Q 4,193,807
48 4,193,808
97 4,193,809
4,193,810
4,193,811
110 4,193,812
122 4,193,813
123 LC 4,193,814
202 4,193,815
277 4,193,816

CLASS 108

59 4,193,351
126 4,193,352

CLASS 109

50 4,193,353

CLASS 110

212 4,193,354
336 4,193,355

CLASS 111

6 4,193,356
34 4,193,357

CLASS 112

79 A 4,193,358
79 R 4,193,359
4,193,360
259 4,193,361
275 4,193,362
278 4,193,363
281 4,193,364
314 4,193,365

CLASS 114

39 4,193,366
68 4,193,367
144 C 4,193,432
230 4,193,368
290 4,193,369
291 4,193,370

CLASS 115

22.2 4,193,371

CLASS 118

17 4,193,373
58 4,193,374
504 4,193,375
658 4,193,376
713 4,193,372

CLASS 119

20 4,193,377
60 4,193,378

CLASS 123

32 C 4,193,379
32 EG 4,193,380
119 A 4,193,381
4,193,382
136 4,193,383
179 L 4,193,384
198 DC 4,193,385

CLASS 124

22 4,193,386

CLASS 126

121 4,193,387
263 4,193,388
429 4,193,390
430 4,193,543
438 4,193,391
451 4,193,389

CLASS 127

46 A 4,193,817

CLASS 128

1 R 4,193,392
57 4,193,394
90 4,193,395
152 4,193,396
204.18 4,193,406
207.19 4,193,397
213 R 4,193,398
214.4 4,193,399
4,193,400
260 4,193,401
272 4,193,402
275 4,193,403
280 4,193,404
296 4,193,405
360 4,193,407
710 4,193,393
734 4,193,408

CLASS 131

23 R 4,193,409
170 R 4,193,410
171 R 4,193,411
264 4,193,412

CLASS 134

1 4,193,818

CLASS 135

2 4,193,413
4 R 4,193,414
25 R 4,193,415

CLASS 136

89 P 4,193,820
89 PC 4,193,819

CLASS 137

75 4,193,416
118 4,193,418
192 4,193,417
322 4,193,419
356 4,193,420
625.33 4,193,421
625.49 4,193,422
625.64 4,193,423
855 4,193,424
861 4,193,425

CLASS 138

109 4,193,426

CLASS 139

54 4,193,427
114 4,193,428

CLASS 141

4 4,193,429
12 4,193,430

CLASS 144

134 C 4,193,431

CLASS 145

30 R 4,193,433

CLASS 148

1.5 4,193,821
3 4,193,822
6.35 4,193,823
12.4 4,193,824
16.6 4,193,825
189 4,193,826

CLASS 149

1 4,193,827

CLASS 151

38 4,193,434
41.76 4,193,435

CLASS 152

158 4,193,436
330 RF 4,193,437

CLASS 156

148 4,193,828
276 4,193,829
306 4,193,830
309 4,193,831
331 4,193,832
358 4,193,833
521 4,193,834
606 4,193,835
657 4,193,836

CLASS 159

6 W 4,193,837

CLASS 160

166 A 4,193,438
188 4,193,439

CLASS 162

5 4,193,838
19 4,193,839
49 4,193,840
152 4,193,841
199 4,193,842

CLASS 164

432 4,193,440

CLASS 165

32 4,193,441
35 4,193,442
66 4,193,443
76 4,193,444
79 4,193,445
108 4,193,446
145 4,193,447

CLASS 166

60 4,193,448
72 4,193,449
155 4,193,450
248 4,193,451
274 4,193,452
295 4,193,453
302 4,193,454
359 4,193,455

CLASS 172

272 4,193,456
276 4,193,457
328 4,193,458

CLASS 173

43 4,193,459

CLASS 174

45 R 4,194,080
47 4,194,081
74 A 4,194,082

CLASS 175

4.6 4,193,460
19 4,193,461
66 Re.30,230
292 4,193,462
337 4,193,463
364 4,193,464

CLASS 176

19 LD 4,193,843
37 4,193,844

CLASS 177

108 4,193,465

CLASS 178

18 4,194,083
19 4,194,084
101 4,194,085

CLASS 179

1 G 4,194,086
1 GD 4,194,087
1 GS 4,194,088
6 E 4,194,089
18 ES 4,194,090
77 4,194,091
84 VF 4,194,092
99 R 4,194,093
100.41 P 4,194,094
113 4,194,095
147 4,194,096
175 4,194,098

CLASS 180

15 4,193,466
89.17 4,193,468
117 4,193,470
154 4,193,471
164 4,193,469
271 4,193,467

CLASS 181

118 4,193,472
176 4,193,473
287 4,193,474

CLASS 182

8 4,193,475
164 4,193,476
194 4,193,477

CLASS 187

29 R 4,193,478

CLASS 188

2 A 4,193,479
52 4,193,480
71.8 4,193,481

CLASS 190

41 B 4,193,482

CLASS 192

26 4,193,483
60 4,193,484
85 CA 4,193,485

CLASS 193

35 R 4,193,486

CLASS 194

9 T 4,193,487
4,193,488

CLASS 198

406 4,193,489
451 4,193,490
476 4,193,491
781 4,193,492
4,193,493

CLASS 200

5 A 4,194,097
4,194,099
50 A 4,194,100
52 R 4,194,101
67 D 4,194,102
67 E 4,194,103
153 J 4,194,104
159 B 4,194,105

CLASS 204

13 4,193,846
15 4,193,847
28 4,193,848
38 B 4,193,849
79 4,193,850
101 4,193,851
129.46 4,193,852
129.95 4,193,853
149 4,193,854
158 R 4,193,855
186 4,193,856
195 S 4,193,857
268 4,193,858
269 4,193,859
284 4,193,860
296 4,193,861

CLASS 206

217 4,193,494
315 R 4,193,495
380 4,193,496
387 4,193,497
494 4,193,498
524 4,193,499
577 4,193,500
610 4,193,501

CLASS 208

11 R 4,193,862
139 4,193,863
210 4,193,864

CLASS 209

240 4,193,865
393 4,193,503
555 4,193,502

CLASS 210

6 4,193,866
20 4,193,867
35 4,193,868
44 4,193,869
65 4,193,870
142 4,193,871
143 4,193,872
170 4,193,873
232 4,193,874
330 4,193,875
489 4,193,876
520 4,193,877

CLASS 211

119 4,193,504

CLASS 212

55 4,193,505

CLASS 215

11 C 4,193,506
12 R 4,193,507
226 4,193,508
330 4,193,509

CLASS 219

75 4,194,107
123 4,194,106
216 4,194,108
386 4,194,109

CLASS 220

5 A 4,193,510

CLASS 221

66 4,193,511
185 4,193,512

CLASS 222

1 4,193,513
4 4,193,514
57 4,193,515
4,193,516
78 4,193,517
105 4,193,518
111 4,193,519
133 4,193,520
142.4 4,193,521
145 4,193,522
254 4,193,523
484 4,193,524

CLASS 224

35 4,193,525
273 4,193,526

CLASS 226

74 4,193,527

CLASS 228

37 4,193,528
107 4,193,529
263 4,193,530

CLASS 229

2.5 EC 4,193,531
28 R 4,193,532
34 R 4,193,533
44 CB 4,193,534
52 B 4,193,535

CLASS 233

11 4,193,536
20 A 4,193,537
26 4,193,538

CLASS 235

83 4,194,111
92 NG 4,193,539
132 E 4,194,112
450 4,194,110
454 4,193,540

CLASS 236

1 G 4,193,541
34.5 4,193,542

CLASS 238

347 4,193,544

CLASS 239

109 4,193,545
112 4,193,546
156 4,193,547
230 4,193,548
251 4,193,549
314 4,193,550
333 4,193,551
533.13 4,193,552
586 4,193,553

CLASS 241

19 4,193,554
37 4,193,555
186 R 4,193,556

CLASS 242

18 A 4,193,557
58.4 4,193,558
67.1 R 4,193,559
71.9 4,193,560
84.2 G 4,193,562
84.51 A 4,193,561
85 4,193,563
107.4 A 4,193,564
4,193,565
4,193,566

CLASS 244

3.16 4,193,567
23 C 4,193,568
100 R 4,193,569
165 4,193,570

CLASS 248

343 4,193,571
535 4,193,572

CLASS 249

9 4,193,573

CLASS 250

308 4,194,114
4,194,115
311 4,194,116
328 4,194,117
343 4,194,118
352 4,194,119
381 4,194,120
439 P 4,194,121
476 4,194,122
492 A 4,194,123
492 R 4,194,124
504 4,194,125
527 4,193,879
566 4,194,126
572 4,194,127

CLASS 251

1 A 4,193,574
144 4,193,575
149.6 4,193,576
167 4,193,577
283 4,193,578
288 4,193,579
309 4,193,580
328 4,193,581

CLASS 252

8.8 4,193,880
17 4,193,881
47.5 4,193,882
49.9 4,193,883
51.5 R 4,193,884
78.3 4,193,885
90 4,193,886
91 4,193,887
99 4,193,888
255 4,194,165
316 4,193,889
407 4,193,890
411 R 4,193,891
428 4,193,892
429 B 4,193,893
440 4,193,894
441 4,193,895

CLASS 254

131 4,193,582

CLASS 256

11 4,193,583
19 4,193,584
65 4,193,585
69 4,193,586

CLASS 260

2.3 4,193,896
17 R 4,193,897
23 XA 4,193,898
23.5 A 4,193,899
28.5 B 4,193,900
4,193,901
29.6 H 4,193,904
29.6 R 4,193,903
29.6 TA 4,193,902
30.6 R 4,193,905
31.2 R 4,193,906
37 N 4,193,907
40 R 4,193,908
42.15 4,193,909
42.43 4,193,910
45.7 P 4,193,911
45.75 B 4,193,912
45.75 S 4,193,913
45.85 R 4,193,914
112.5 R 4,193,915
146 R 4,193,916
239 A 4,193,917
239.1 4,193,918
239.3 P 4,193,919
4,193,920
239.55 R 4,193,921
315 4,193,923
326 C 4,193,924
326.26 4,193,927
326.5 FN 4,193,925
326.5 S 4,193,926
345.7 R 4,193,928
348.25 4,193,929
397.2 4,193,930
453 PH 4,193,932
453 RW 4,193,933
465 R 4,193,934
505 R 4,193,935
557 R 4,193,936
570 R 4,193,937
582 4,193,938
583 R 4,193,939
586 C 4,193,878
586 F 4,193,940
592 4,193,941
604 HF 4,193,942
4,193,943
659 R 4,193,944

CLASS 261

39 B 4,193,946
41 D 4,193,947
65 4,193,948
87 4,193,949
4,193,950
91 4,193,951

CLASS 264

0.5 4,193,953
3 B 4,193,952
13 4,193,954
23 4,193,955
27 4,193,956
46.4 4,193,957
86 4,193,958
128 4,193,960
166 4,193,959
176 F 4,193,961
178 F 4,193,962

CLASS 267

170 4,193,587

CLASS 269

47 4,193,588

CLASS 270

31 4,193,589

CLASS 271

119 4,193,590

CLASS 272

78 4,193,591
114 4,193,592
137 4,193,593

CLASS 273

1 R 4,193,594
4,193,595
11 C 4,193,596
143 R 4,193,599
148 R 4,193,600
167 R 4,193,601
236 4,193,602
313 4,193,598
405 4,193,597

CLASS 277

3 4,193,603
117 4,193,604
184 4,193,605
205 4,193,606

CLASS 279

1 DC 4,193,607
2 R 4,193,633

CLASS 280

8 4,193,608
12 K 4,193,609
414 R 4,193,610
415 A 4,193,611
681 4,193,612
804 4,193,613
4,193,614

CLASS 283

1 A 4,193,615

CLASS 285

39 4,193,616
336 4,193,617

CLASS 292

7 4,193,618
168 4,193,619
169.17 4,193,620

CLASS 293

142 4,193,621

CLASS 294

1 BB 4,193,623
1 CA 4,193,622
19 A 4,193,625
19 R 4,193,624
54 4,193,626
82 R 4,193,627

CLASS 296

137 B 4,193,628
190 4,193,629

CLASS 297

17 4,193,630
408 4,193,631
446 4,193,632

CLASS 299

17 4,193,634
4,193,635
39 4,193,636
56 4,193,637
89 4,193,638

CLASS 301

9 DH 4,193,639
37 AT 4,193,640

CLASS 303

50 4,193,641
97 4,193,642
118 4,193,643

CLASS 307

3 4,194,128
149 4,194,129
205 4,194,130
209 4,194,131
4,194,132
221 D 4,194,133
255 4,194,134
260 4,194,135
296 R 4,194,136

CLASS 308

9 4,193,644
23 4,193,645
187.1 4,193,646

CLASS 310

52 4,194,137
324 4,193,647

CLASS 312

9 4,193,648
205 4,193,650
280 4,193,652
346 4,193,649

CLASS 313

3 4,194,138
153 4,194,139
471 4,194,140
503 4,194,141

CLASS 315

39.77 4,194,142
241 R 4,194,143

CLASS 318

341 4,194,144
799 4,194,145

CLASS 320

44 4,194,146

CLASS 323

17 4,194,147

CLASS 324

220 4,194,149
245 4,194,150
453 4,194,148

CLASS 328

267 4,194,160

CLASS 329

50 4,194,161

CLASS 330

4.3 4,194,162
86 4,194,163
130 4,194,164
257 4,194,166

CLASS 331

38 4,194,167
94.5 C 4,194,168
94.5 G 4,194,169
94.5 N 4,194,170

CLASS 333

149 4,194,171
165 4,194,172

CLASS 335

260 4,194,173

CLASS 338

308 4,194,174

CLASS 339

17 D 4,193,653
4,193,659
17 LC 4,193,654
28 4,193,651
31 R 4,193,655
45 M 4,193,656
63 M 4,193,657
97 P 4,193,658
98 4,193,201
191 R 4,193,660

CLASS 340

52 D 4,194,175
147 R 4,194,176
152 T 4,194,177
183 4,194,180
201 R 4,194,178
211 4,194,179
286 R 4,194,181
310 R 4,194,182
347 AD 4,194,183
4,194,185
4,194,186
4,194,187
347 P 4,194,184
365 E 4,194,188
373 4,194,189
407 4,194,190
515 4,194,191
517 4,194,192
545 4,194,193
566 4,194,194
661 4,194,195
711 4,194,196
4,194,197
724 4,194,198
754 4,194,199

CLASS 343

5 SM 4,194,200
6.5 LC 4,194,201
7 PF 4,194,202
4,194,203
7.4 4,194,204
17.7 4,194,205
18 E 4,194,206
120 4,194,207
715 4,194,208
753 4,194,209

CLASS 346

75 4,194,210
4,194,211

CLASS 350

96.15 4,193,662
96.16 4,193,661
96.18 4,193,663
96.21 4,193,664
96.22 4,193,665
174 4,193,666
183 Re.30,231
187 4,193,667

281 4,193,668
334 4,193,669
357 4,193,670

CLASS 351

160 H 4,193,671
160 R 4,193,672

CLASS 352

78 R Re.30,232

CLASS 354

23 D 4,193,673
59 4,193,674
86 4,193,675
106 4,193,676
127 4,193,677
204 4,193,678

CLASS 355

1 4,193,679
3 FU 4,193,681
3 R 4,193,680
10 4,193,682
4,193,683
40 4,193,684
41 4,193,685

CLASS 356

150 4,193,687
152 4,193,688
4,193,689
301 4,193,690
330 4,193,691
341 4,193,692
346 4,193,693
407 4,193,694
418 4,193,695

CLASS 357

24 4,194,213
30 4,194,212
41 4,194,214

CLASS 358

56 4,194,215
60 4,194,216
93 4,194,217
100 4,194,218
167 4,194,219
221 4,194,220
283 4,194,221

CLASS 360

18 4,194,222
41 4,194,223
97 4,194,224
98 4,194,225
106 4,194,226
122 4,194,227
133 4,194,228
137 4,194,229

CLASS 361

1 4,194,230
45 4,194,231
213 4,194,232
233 4,194,233

CLASS 362

17 4,194,234
38 4,194,235
66 4,194,236
253 4,194,237

CLASS 363

17 4,194,238
109 4,194,239
126 4,194,240

CLASS 364

200 4,194,241
4,194,242
4,194,243
428 4,194,244
900 4,194,245

CLASS 366

66 4,193,696
129 4,193,697
130 4,193,698
4,193,699
156 4,193,700
159 4,193,701
343 4,193,702

CLASS 367

1 4,194,246

CLASS 368

34 4,193,255
74 4,193,256

CLASS 371

20 4,194,113

CLASS 400

124 4,193,703

CLASS 402

19 4,193,704
46 4,193,705

CLASS 403

19 4,193,706
4,193,707
188 4,193,708
191 4,193,709

CLASS 404

128 4,193,710

CLASS 405

39 4,193,711
52 4,193,712
159 4,193,713
204 4,193,714
261 4,193,715
267 4,193,716
283 4,193,717
286 4,193,718

CLASS 407

49 4,193,719

CLASS 408

11 4,193,720
68 4,193,721

CLASS 409

59 4,193,722
122 4,193,723
141 4,193,724

CLASS 410

7 4,193,349
64 4,193,350

CLASS 414

83 4,193,725
114 4,193,726
223 4,193,727
460 4,193,728
532 4,193,729
537 4,193,730
589 4,193,731
609 4,193,732
694 4,193,733
4,193,734
744 4,193,735
786 4,193,736

CLASS 415

73 4,193,737
115 4,193,738
118 4,193,739

CLASS 416

132 A 4,193,740
170 R 4,193,741

CLASS 417

295 4,193,742
481 4,193,743
567 4,193,744

CLASS 418

9 4,193,745
32 4,193,746
4,193,747
173 4,193,748
201 4,193,749

CLASS 422

52 4,193,963
90 4,193,964
95 4,193,965
122 4,193,966
170 4,193,967

CLASS 423

112 4,193,968
139 4,193,969
141 4,193,970
242 4,193,971
244 4,193,972
265 4,193,973
348 4,193,974
4,193,975
406 4,193,976
415 P 4,193,977
648 R 4,193,978

CLASS 424

1.5 4,193,979
3 4,193,980
12 4,193,981
4,193,982
4,193,983
16 4,193,984
19 4,193,985
28 4,193,986
49 4,193,987
52 4,193,988
60 4,193,989
89 4,193,990
4,193,991
105 4,193,992
141 4,193,993
249 4,193,994
250 4,193,995
256 4,193,996
4,193,997
258 4,193,998
267 4,193,999
270 4,194,000
273 R 4,194,001
274 4,194,002
4,194,003
283 4,194,029
300 4,194,004
304 4,194,005
308 4,193,931
311 4,194,006
318 4,194,007
322 4,194,008
330 4,194,009
341 4,194,010

CLASS 425

60 4,193,750
83.1 4,193,751
131.1 4,193,752
311 4,193,753
424 4,193,754

CLASS 426

8 4,194,011
53 4,194,012
96 4,194,013
231 4,194,014
233 4,194,015
419 4,194,016
533 4,194,017
580 4,194,018
4,194,019

CLASS 427

16 4,194,020
95 4,194,021
109 4,194,022
138 4,194,023
180 4,194,024
215 4,194,025
244 4,194,026
249 4,194,027
4,194,028
286 4,194,030
289 4,194,031
341 4,194,032
351 4,194,033

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